

# SUPPLEMENT.

# The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

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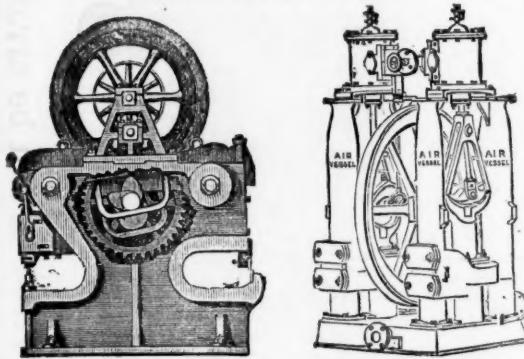
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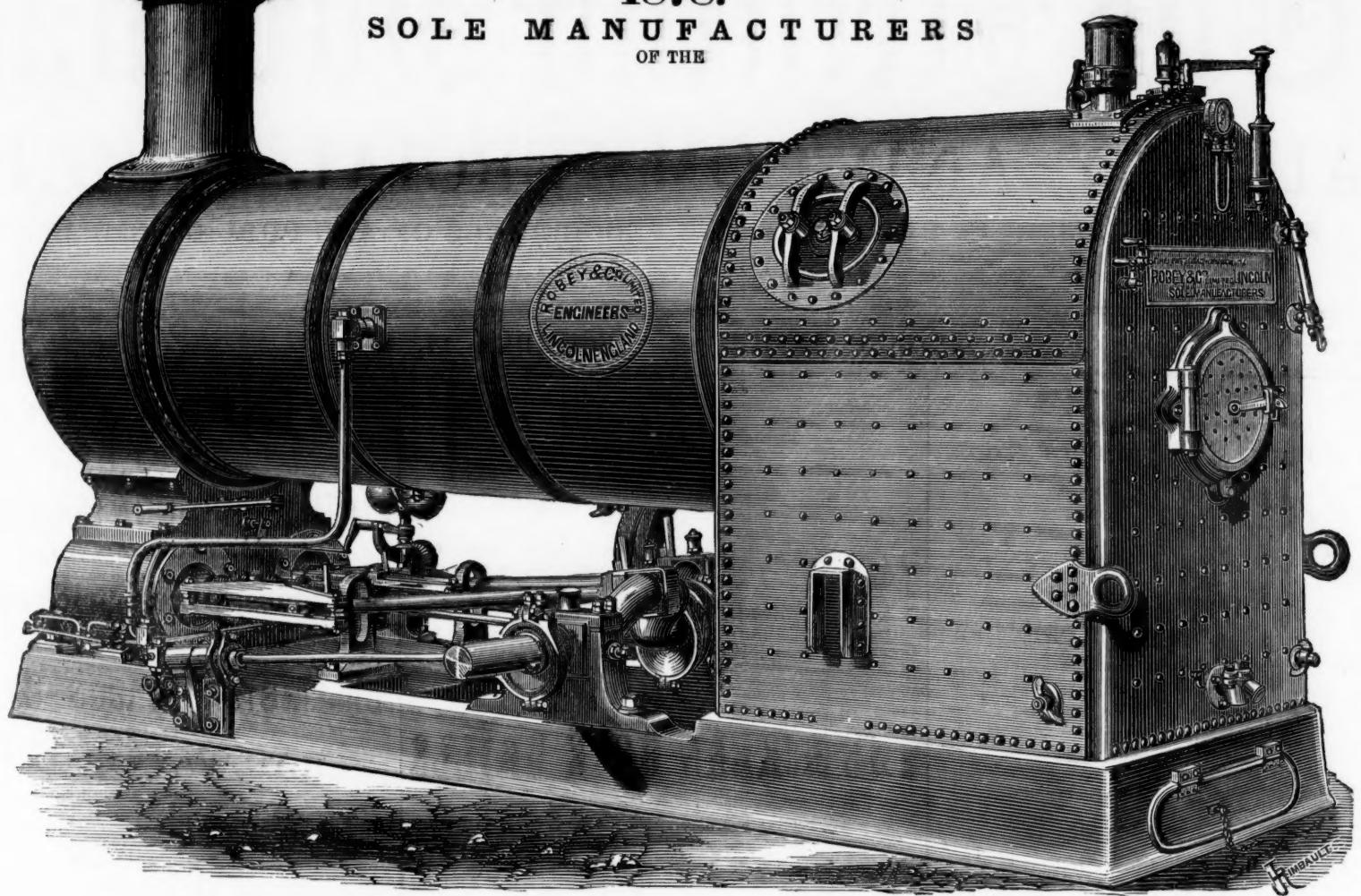
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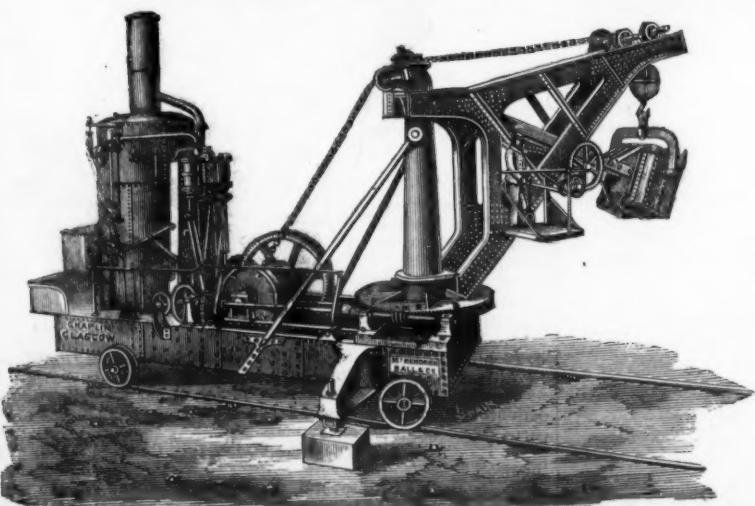
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## Original Correspondence.

## MINERS' NATIONAL RELIEF FUND.

SIR.—The editor of a new-paper—for many practical purposes—is as much as a crooked head; and as you have written sarcastically about my letter on the above subject to Her Majesty, it may well be that you will consider I am taking an analogous liberty in addressing you, and thus trespassing—as you call it—upon the "courtesy" of the "Court." We cannot all of us be as well up in the proprieties as the choicer spirits of mining literature; and I quite see that in the hot haste provoked by the fearful loss of life at Abercarne, I made a mistake in the mode in which I approached Her Majesty; though the "courtesy" of the Queen's late secretary did not evaporate—as you appear to suppose—in the one published reply, but has been continued in several subsequent communications by himself and his successor. Both these gentlemen have manifested a strange lack of that invidious estimate of my motives, which would appear, unfortunately, to have possessed you, as the recognised *arbiter morum* for people who subscribe for the relief of suffering.

So much in reply to the personal portion of an article of Nov. 30, which I only saw this morning. In regard to the general question of a central permanent relief fund, I must repudiate the statement that I have ever propounded any "scheme" as you are pleased to term it. I certainly suggested a national fund, but in all that I have written upon the subject I have expressly guarded myself against laying down any exact or definite lines—believing that, if the idea were taken up at all, there would be valuable and experienced aid derivable from many persons far fitter than myself to elaborate the *modus operandi* in the future. You lay considerable stress upon the value of local societies; but of what avail were these when the late catastrophe occurred at Abercarne? Of what use would they be if a similar blow-up happened somewhere else tomorrow? My contention is that the present dispensation of charity resultant upon great mischief of the sort is cumbrous, time-wasting, partial, and even unjust in its operations. The Mayor of Manchester recently said that public men occupying positions similar to his were very awkwardly placed *vis à vis* of these reiterated appeals to the public, and that his hands seemed always to be diving into other peoples' pockets. His worship might have added that it was also rather awkward that himself and his brother chief magistrates in London and Liverpool were in the main the only officials appealed to—by far the majority of their worshippers throughout the country going scot-free. Yet why Manchester and Liverpool should get up subscription lists whilst Bristol and Birmingham, Penzance, and Norwich do nothing of the sort, it is difficult to understand. No doubt you will be able to throw a competent light upon the subject.

I have been accused, in "a scheme" which I never propounded, of overlooking existing local organisations for relief, and therein to have done wrong to those important bodies. So far from having done this, I actually quoted in one of my letters the rate of relief afforded by the Durham societies; and in a previous letter I suggested that the Central Trust, which I hoped would ultimately be constituted, should distribute its grants when made through the relief society of the district. If you and I cannot agree about other things—which personally I regret—I think you will go with me in this statement at least—that it is in the last degree deplorable that persons who might desire, and who, doubtless, already have desired, to leave some money for the relief of the families of miners in their wills, are now unable to do so through the absolute lack of any constituted trust for the reception of these funds. Other branches of employment are safely provided for in this respect—the lifeboat fund, for instance, and others which might be mentioned. Why not the miners? Would it really militate seriously against an arrangement of the sort if all the bishops in England were to baptise it "Centralisation?"

I am afraid your Editorial judgment has been unduly warped by the speech of the Bishop of Manchester, or something else. How otherwise can one account for your change of tone on this question of centralisation and my championship (?) thereof between Oct. 19 and a subsequent issue. In the former notice you take credit for having advocated a "National Permanent Relief Fund" for 25 years! In the same article you do me the honour to say that I am so well known for my energy and perseverance that "there is now a reasonable prospect of the suggestion (the italics are mine) being carried to success."

What have I done in the interval to offend your susceptibilities that I am all at once so undesirable a coadjutor in efforts to do good as your latest utterances herein would seem to suggest? Perchance you will answer that second thoughts are always best; and, as you are the judge of those thoughts, I fear I can have no appeal. I am as unlucky, apparently, with judges of ability as with kings and potentates generally; and my excuse must be that if I have got hold of an inexpedient idea—ridiculous in itself, and withering to the common sense of bishops—I have only sinned recently, instead of "keeping at it" continuously for 25 years. ELLIS LEVER.

Manchester, Dec. 7.

[The regrettable discrepancy to which Mr. Lever refers arose from prominence having been given to the views of a correspondent without an accompanying statement that his opinions were not in any respect endorsed by the Editor. Of the desirability of a Miners' Permanent National Relief Fund the Editor has never entertained the slightest doubt, and that with the assistance of Mr. Ellis Lever, whose energy and perseverance was correctly noticed in our article of Oct. 19, the prospect of the Fund being incorporated is better than at any previous time is equally beyond question. So far from our judgment having been warped adversely to the Fund by the Bishop of Manchester's speech, we are convinced that not only will Dr. Fraser throw no obstacles in the way, but that his caution will be positively advantageous to the project. He is the most popular and practical bishop on the Bench, and is, therefore, able to point out better than many others defects which would lead to failure, but as soon as a really workable plan—which can only be hoped for by criticism and amendment—is secured, the Bishop of Manchester will be found amongst the last to shirk the necessary hard work to make it a success. We are glad to learn that the establishment of the Fund is progressing satisfactorily, and that Mrs. Lever has received a letter from Windsor Castle authorising the announcement of a subscription of "one hundred guineas in memory of Sir Thomas Biddulph in aid of the Miners' National Relief Fund," although the donor (a lady) does not permit her name to transpire.]

## BOILER EXPLOSIONS.

SIR.—The Manchester papers of Tuesday last contain an account of an explosion at a colliery of a steam-boiler consequent on its being overheated through deficiency of water, the latter arising from the packing being forced out of a manhole or mudhole joint at the lower part of the boiler; and I much regret to note that the accident has been accompanied by very serious injury to a number of men.

As cases of deficiency in water in steam-boilers, arising from various causes, are numerous I think that the following remarks will not only be interesting but probably instructive to many steam users and boiler attendants. I have long been convinced that if a boiler has become short of water and the plates are already bared attempting to draw the fire is generally most dangerous, as the operation will usually much increase the heat of the furnace or furnaces. In many such instances rupture of the plate has occurred, accompanied with scalding and fatal results to those engaged. I subjoin extract from our printed "Instructions to Firemen" on this point:—"Should the water fall below the proper level draw the fires at once; but if the furnace plates are already bared of water when deficiency is discovered, it will be preferable to damp the fire, by immediately throwing on ashes or other non-combustible matter, as the act of drawing them might cause serious increase of heat." Should sufficient ashes or other suitable material not be immediately available for the purpose the fires may be considerably checked by immediately closing the damper, and by throwing on as rapidly as possible a large quantity of the smallest coal. The connection with the damper should always be readily accessible in the firing place, and not necessitate climbing on the top of the boiler to reach

it. Many owners object to applying safeguards against deficiency of water to their boilers, alleging that such apparatus renders the men more careless. From my investigation of some hundreds of explosions, and the inspection of many thousands of boilers, I am convinced that, in the main, this idea is quite erroneous. Deficiency of water may arise from many accidental causes, for which the attendant is not actually responsible, and even the best men are liable to mistake; whilst steam-boilers are not always constantly attended by the same man, but are occasionally in the charge of watchmen and others during the night or at other times. Our company is so impressed with the importance of the attachment of the low-water apparatus that we now allow a discount from our insurance premiums for all those I consider of an efficient character, although we give an especial preference to the "double cone" fusible plug.

As a contrast to the above case, I may mention that some years ago a Cornish boiler situated, like the exploded one, at a colliery and down the pit became short of water whilst in full operation, owing to the fracture of the blow-out pipe. The rush of water, &c., from this pipe was so great that the fireman could not get near to draw the fire, but was obliged to withdraw to a safe distance. Fortunately the boiler was fitted with a double cone plug, which promptly acted, and prevented any damage whatever. The low-water safety-valves frequently applied are a valuable fitting, as they are likely to direct the attention of attendants to any deficiency which may arise; but I advise in addition a good fusible plug to each furnace *et cetera*, as no valve, however powerful, can in some cases discharge the steam with sufficient rapidity to prevent damage.

A case occurred a few weeks ago where after the cleaning of a boiler the blow-out tap was inadvertently left open, but the orifice was closed with muddy deposit swept from the boiler, which retained the water when it was filled up, and led the attendant to believe the tap was closed. Steam was got up, but when it reached about 20 lbs. per square inch the mud was forced away, and the water rapidly escaped. The attendant noted this, and commenced immediately to draw the fires, but before he could complete one furnace the water had fallen so low that the crown of the second furnace had become red hot, and was bulged down almost to the fire-bars, fortunately without rupture. The boiler was provided with a low-water safety-valve, but such apparatus could not possibly prevent damage in such a case. Had there been reliable fusible plugs in addition these would have acted, and have averted the great risk of explosion which was incurred.

I may add, in conclusion, that it is useless to apply any fitting or preventive apparatus unless these have that regular and careful attention requisite to retain them in reliable condition, and which is indispensable to every detail in connection with steam-boilers.

HENRY HELLER, Chief Engineer.

*The National Boiler Insurance Company, Manchester.*

## ON CONSUMPTION OF FUEL IN MINING ENGINES.

SIR.—Having already in former papers given the result of experiments with Lancashire and common cylindrical boilers as to evaporative power in pounds of water per pound of coal consumed; and with the cylindrical boilers experiments as to the comparative economy of hand firing and mechanical stoking have been noticed. It has been shown that with powdered coal and the proper quantity of air blown into the fire-box to ensure complete combustion, much better results have been obtained than with the largest steam coal and firing in the ordinary way. There is room for effecting greater economy in firing boilers by mechanical means; as yet Jucke's fire-grate is the only apparatus that is much adopted. It is certainly a perfect consumer of smoke, but a more perfect apparatus is required to supply small coal and air simultaneously and in proper proportions to afford complete combustion.

Boilers of the locomotive type are now much used, both for mining and agricultural engines; indeed, it is the agricultural engine, with various modifications, that has been applied in mining for winding and hauling coal, and for pumping water. Very good evaporative results have been obtained with this form of boiler, though the ratio of fire-grate and area of heating surface vary considerably. The area of fire-grate being given, the consumption of fuel would be influenced by the draught of the chimney, or the blast-pipe, as the case may be, and the quality of the fuel. The proportion of heating surface in locomotives varies from 50 or 90 square feet to 1 square foot of fire-grate. The combustion of fuel varies from 50 to 80 lbs. per hour per square foot of grate. The relative value of fire-box and tube surface is not considered of much importance so long as the heat given out by the fuel is absorbed by the water to the fullest extent. In some cases the effect of the fire-box is found to be much greater than that of the tubes—that is, when the duty of the boiler is little, but when the duty is increased the tubes take their part of the duty, and the ratio of greatest effect is on the part of the tubes. The ratio of surface of tubes to that of the fire-box in locomotive engines varies from 8 or 15 to 1.

Fuel may be used in a gaseous as well as in a solid form; the gas produced in blast-furnaces is now utilised in heating and producing steam in the boilers at many ironworks; and in the solid state it may be used in various forms, as large and small coal, the latter giving more heating effect provided there is proper access for the air to act on the particles. As an example of the evaporative power of locomotive boilers, the following is the result of a trial of one of the best agricultural engines at Cardiff in 1872. The engine was of 8-horse power nominal. Steam was used of 80 lbs. pressure per square inch; the horse-power developed by the engine was 14. Area of fire-grate as used was 3-2 square feet, but the full size of grate was 5-3 square feet. The total heating surface was 220 square feet; of this 25-4 was in the fire-box, and 194-6 in the tubes, in the ratio of 1 to 7-6; the heating surface relatively to fire-grate used was thus 69 to 1. The fuel used was Llanguennech steam coal, its theoretical effect in producing steam from water at 60° was found by analyses to be 13-2 lbs. of water evaporated by 1 lb. of coal. The evaporative duty of the engine experimented on per hour using this fuel was 419 lbs. water, or 6-7 cubic feet. The duty was equal to 1-9 lbs. of water per square foot of heating surface: 40-9 lbs. of coal were used per hour, giving 10-24 lbs. of water evaporated per pound of fuel, and 12-8 lbs. of coal consumed per hour per square foot of grate. To obtain this result the coal was added 30 times in an hour, and no more air was allowed to enter than was requisite for complete combustion. This frequent application of the fuel is more like mechanical firing, which could not be carried out in practice. The evaporative duty per hour per foot of fire-grate used is = 131 lbs.

3-2

The ratio of evaporative duty given out by the fuel to the theoretical duty is 13-2: 10-24:: 100 = 77 per cent. The temperature of the heated air escaping at the smoke-box into the chimney varied from 360° to 418°; this is, perhaps, as low a temperature as can in practice be obtained at the bottom of the chimney. The heated gases escape at that end of the tubes at a great velocity, not affording sufficient time for a further absorption of heat. The lengthening of the tubes has not been found of any service. The gradual expansion of the tubes towards the smoke-box might produce a lower temperature of the escaping gases. The temperature of the atmosphere was 60°; this from 360°, gives 300° of heated air lost in the boiler.

From this experiment we see the great utility of careful firing, and what might probably be achieved by a mechanical method of firing, admitting only as much air as is required for perfect combustion. The heating surface was 70 times greater than the area of grate utilised, the waste gases escaping at a temperature of 418°, and as low as 360° at the funnel.

The following gives the result of similar trials on an engine running on the Midland Railway. The fuel used was coke, and the temperature of the feed water 60°. The ratio of tube to fire-box surface was 10-3 to 1. Ratio of total heating surface to fire-grate area, 7-1 to 1. Area of fire-grate, 9-1 square feet. Coke = 132 lbs. consumed per hour per square foot of grate. The water evaporated per hour was 162 cubic feet = 10,125 lbs. Consumption of coke, 1,267 lbs. per hour, equal to 7-98 lbs. of water evaporated per pound of coke burnt. Temperatures as taken by pyrometer in the firebox, 274°, and in the smoke-box 937°, showing a difference of 181°.

absorbed in heating the water from fire-box and tubes. On the rate of the transmission of this difference of heat to the water a great deal depends. The observed temperatures on an engine on the Caledonian Railway were—in the fire-box 2420°, in the smoke-box 363°, and the evaporative duty of this boiler was 10 lbs. of water heated from 60° by 1 lb. of coke. This alone shows the importance of the absorption of heat in the boiler as far as possible in the high duty of the latter experiment.

It has before been explained that economy of fuel is not in accordance with hard firing. In locomotive boilers from 50 to 60 lbs. of fuel per hour per square foot of grate is the rate giving most perfect combustion. With hard firing the loss arises from carbonic oxide passing away unconsumed.

It should be observed that the value of these experiments depends much on the quality of coke used. An allowance of 8 per cent. for ash and water combined with it must be made, and more than this in some instances. It is not known whether the coke was of the same quality in the two locomotives experimented on. It is presumed the same coke was used, and the difference in evaporative duty is accounted for in the temperature of the gases in the smoke-box. To treat the fuel so as to give a proper admixture of air by mechanical means would certainly be very desirable to ensure perfect combustion, and the absorption of heat by the water should be as complete as possible to give economy in consumption of fuel. M. E.

## CHONTALES MINING COMPANY.

SIR.—At a meeting held on Nov. 28 the attendance of the shareholders was few in number; in the concise report of the meeting in your valuable Journal there is the absence of information on points in detail. It would appear that the directors gave an order to Messrs. Harvey, of Hayle, for 36 stamps to be put in hand, that order was given Aug. 9, 1877; 24 were executed in October, the remaining 12 in November. I went to the meeting gratified with the opinion of a mining engineer who has distinguished himself in Spain, and was accompanied there by one of the original shareholders of the Chontales Company (and by a system introduced by him in working a mine effected a saving of 50 per cent.), also by a gentleman who has returned from Australia, a manager of gold mines, introduced to me by the Principal of the Mining School for Bristol. They informed me that 36 stamp-heads, 36 shoes of prepared steel, 36 tappets, steam band to drive pneumatic stamps, and mercury, might and ought to be executed and delivered within one month of the order being given. I handed in a letter I received from the Tuckmill Foundry Company, Camborne, Cornwall, in which they stated they would undertake to deliver in fourteen days after the order was given 36 stamp-heads. The noble Chairman made the statement that they were satisfied with Messrs. Harvey, that they had always taken care to complete their orders with satisfaction to the board, and referred to a wheel on one occasion, that rather than send out one imperfect they had cast three. As a shareholder that spur wheel I shall not easily forget; it was my first introduction to the bar at Greytown. The wheel completed, when forwarded the bar prevented its delivery; the delay occasioned when landed its being carried to its destination in consequence of the San Juan river. I ask the question, if those who have to supply us with machinery ought not to be under contract to deliver in a given time, or take upon themselves the responsibility that arises from the delay? If one company would not another may. Time with us is the essence of the contract, whilst I admit that it is essential that machinery forwarded to so great a distance should be executed in the best manner. I would further remark, in reference to the observation I made as to the time machinery could be executed, that Mr. Truran prompted the noble Chairman that Mr. Bell had tried stamps by other makers, and that he knew the firm I alluded to. No doubt the Tuckmill Company can give first-class references as to the machinery they supply. Mr. T. S. opinions seemed to have a crushing influence upon any remarks that I had advanced as to economy of time in supplying machinery.

It next becomes a question as to the transit of machinery. We have at our command a line of steamers of which it may be said they are second to none. Before going to the meeting I called at the office of the company, in Moorgate-street, and endeavoured to obtain information why machinery, stores, &c., sent out by them in October, 1877, were not delivered until March, 1878. They could not give me any satisfactory information, and I found at Gresham House the fog equally as great. The only information I have been able to obtain is that on arrival at Greytown on the first occasion the bar prevented, and that upon another occasion the mailboat was too much laden to take our machinery, stores, &c. On the arrival at Greytown the mailboat remains four days, and if heavy machinery cannot be delivered why not portions of lesser weight? Bar or no bar the mails are delivered. It seemed a question with the Chairman as to liability, and if liable difficulty as to damages.

If you refer to the report of the half-yearly meeting—June, 1877—the agents make a statement that the machinery had been delivered; they contradict that statement, and up to the present time no information has been received from them to account for the delay. In consequence of the time that has been lost in the arrival of machinery, &c., we crushed only 250 tons during the month of April this year. If we take Mr. White's report, and the opinion he expresses, that on his arrival no one could tell him where he was to get an ounce of gold, and that the mines were all run together and had to be re-timbered; if you trace results from August to January, 1878, you will find continuous profits, although those profits were reduced (as the machinery became impaired); whilst we find the losses commenced increased, until he was supplied with and erected new machinery; after that the profits have increased from in July 1711, August 2861, and September to 6721. Our report gives for six months ending June 3602 tons of ore crushed, for the three following months 5030 tons, and were it not for the unprecedented dry weather he has a capability of crushing 2500 tons a month. The cost that was 17. 2s. 5d. per ton is reduced (less the office expenses) to 13s. 3d. a ton.

The next question is that of calling up debentures. Mr. Waite in his letter says: "I would advise that the returns should not again be interfered with, and that no new outlay should be made for the present, as this season, with the last, seems to be something unusual, and next year we may again get rain, as in former times, and if so very little steam power will be required at San Domingo. Not only so, but by that time I hope to see the company in a good position, when I shall be able to decide with greater courage and better judgment for the future permanent working of the mine." As regards the steam-engine, what is it to cost? 1000. For what purpose? To drive pneumatic stamps, which can be driven independent of steam. After the year we have had them what number of tons have they crushed? 528. What is the number of Cornish stamps they are equal to? Five. When would it arrive, especially ordered at this time of year? A query the shareholders are asked to go into debt, and pay 10 per cent. for so doing.

There was another question I brought before the board. When at the West India Mail Company's office I made enquiries as to the route to San Juan del Sur via Panama. I found that the boat left Panama for San Juan del Sur on the 15th of the month; the mail leaves Southampton on the 18th, arriving on the 8th of the following month. As regards freight, it is nearly double. By that route the bar at Greytown and the San Juan difficulties are overcome. I referred to the Wheeler pans having gone that route from San Francisco, and that the directors were aware of any difficulties that presented themselves. Mr. Truran prompted the Chairman that the difficulties were equally as great by way of San Juan del Sur as via Greytown. I am getting posted up on that point by a gentleman going to Central America.

I am informed by a reliable authority that we can do without steam power, that by means of a 3-in. diameter pipe 5000 tons of quartz could easily be crushed per month throughout the year; that the cost of the arrangement would not be expensive. It would consist of an arrangement of piping which would be of some length, and of a system of piping to work with a high pressure turbine. As regards our manager, Mr. White, we are fortunate as a company in having secured his services, and if he has the co-operation of those we have to look to at home we have nothing to fear.

I will conclude with an extract from a letter of mine that ap-

peared in the Journal of Dec. 22, 1877:—"The mine stands before us faultless; has advantages few mines possess; quantity of auriferous ore unlimited; can be worked independent of sinking shafts and machinery to haul to surface, there being a rise of 500 ft. in two miles of the company's property, and we are well through one mile of the property; in every 50 yards there is a vein of gold, which if found at surface descends to a great depth. We are in the hands of the directors, and if men are sent out who understand the duties they undertake to perform, are sober and honest, the requirements of the mine duly ordered and executed without delay, we have nothing to fear, but reasonable expectations of realising good dividends. Without good management, however good the mine may be, the best concerted schemes prove vain and never succeed."

W. B. PALMER.

All Saints-lane Exchange, Bristol, Dec. 5.

#### AMERICAN IRON (Fe) ORE.

SIR.—In the Journal of Nov. 30 I observe a letter by one of your correspondents on the Iron Question of America. The place to which your correspondent refers is one well known to myself, and I can fully corroborate his statements relative to the famous iron region of Ishpeming. I have spent some eight months in the iron mines of Michigan, during which time I observed closely the geology of that country. All my observations convince me fully that Marquette County is destined to greatness. The iron has been traced for some 25 miles in an irregular course. The outcroppings at certain points show indications of stupendous deposits, and Ishpeming I believe from general observations will, comparatively speaking, be the inexhaustible discovery. Ishpeming a few years ago was a very disagreeable swamp through which it was very difficult to pass, but those having all confidence in the country hauled sufficient poor dirt to fill up the swamps, and made it sufficiently solid on which to build the city of Ishpeming, which has at present, I judge, from 6000 to 8000 inhabitants. The bluffs are linked around the city, on the surface of which the Fe outcroppings are plainly seen. Judging from the general pitch, and other characteristics, I conclude that immediately under Ishpeming there is one vast basin of iron ore. Ishpeming produces the soft ore (hematite) which yields about 60 per cent., and the hard ore (magnetic) yielding 85-715 per cent. This marvellous iron region is reached by the Chicago, North Western, and the Michigan Central Railroads, the latter having a branch running to Marquette city from the junction at Vaganae. Vaganae is near the commencement of this iron region, and is a beautiful city, supported, of course, by the iron trade. Jackson's Main (Hematite, Fe) has been working over twenty years, and is to-day one of their best hematite mines. Ishpeming is situated but a very few miles from Vaganae. Eight miles from Ishpeming and Sagana is reached another, or the third, discovery of the hard ore. This discovery was made by an Englishman, Mr. John Mitchell, and was sold shortly after for \$300,000. Washington and Humboldt Mines are but a few miles further, neither of them being very extensive at present. Twelve miles further and the Republic Iron Mines are reached. These mines a few years ago could produce as much iron as all the other mines, the mineral being mined so easily. The lode here is about 60 ft. wide, and has very little impurities, indeed, the ore is very sensitive to pulverisation. The ore produced here is very rich. Another four miles and Keystone and Champion Iron Mines are reached. The latter of these places is a very extensive mine, the lode varying in width from 6 to 60 ft., some of it being worked on the open-cut principle, clearing the surface, and then underhand stope. Just across the Michigammi Lake, a distance of a few miles, we have another large Fe mine.

There is yet plenty of room for capital, and I think they are just as sure of success as twice 2 are 4. I would say that after leaving the iron region I went to the silver region of Colorado. I have seen many mining camps through the United States, many of them needing capital, and promise good returns to capitalists; but unhesitatingly would speak of the Rocky Mountains as being unparalleled in their advantages to prospectors, though I would scarcely call it prospecting, as they are so sure of success. It is my firm conviction that there are greater fortunes hidden in the Rocky Mountains than have yet been discovered. The silver of the Colorado is immensely rich, and a very small streak of course would pay, it being properly worked. I have known fortunes to be made in the discovery of Ag deposits in a few weeks. Why, confidence in the success of properly worked silver mines of Colorado cannot be moved. It may be difficult to influence our capitalists to speculate in the silver region of Colorado, but I believe the time is coming when they will, and as sure as they commence so sure are they of great success.

If there are any parties desiring information on the mines of Pennsylvania, Michigan, or Colorado I shall be most pleased to give it as far as able either by letter or verbally. I have just returned from the Rocky Mountains of Colorado, and can give any information desired on the silver region of this sierra range. Parties desiring information will do well to avail themselves of this opportunity and address as below.—Millom, Cumberland, Dec. 10. A. B. C.

#### PROGRESS IN CANADA—THE NATIONAL POLICY.

SIR.—The event of this week is the arrival of H.R.H. the Princess Louise and His Excellency the Marquis of Lorne in Canada. All through Saturday, the 23rd, the city had been expecting news of the coming, but it was not till 6:40 P.M. that the Sarmatian entered the port of Halifax. Long before this reaches you your readers will be fully apprised of all the particulars, yet there are some thoughts that may be of interest.

Anthony's arrival in Egypt, the famous voyage of Cleopatra down the Nile to receive him. What a contrast between the effeminate luxury, the soft breezes, the quiet music of such a voyage, and that which mark the voyage of Princess Louise to Canada. In the former all the luxury and degeneracy of the last days of Egypt—in the latter all the manliness, courage, skill, and enterprise of the best days of England, and the first days of Canada. In the former the sluggish Nile, with its banks bounded by papyrus reeds, the vessel a barge, propelled by oars; in the latter the broad Atlantic, terrible in its might, the good ship Sarmatian, propelled by the power of thousands of horses, the voyage from the rock-bound coast of Ireland to the rock-bound coast of Nova Scotia. As the contrast is great in all these particulars so let it be greater in the results. The maiden Canada greets her mother England, and the whole people of Canada, from the Atlantic to the Pacific, greets the daughter of our Queen, and rejoice at the safe termination of an exceedingly stormy passage.

The victory over the storms of the Atlantic has been won, and the victory over the difficulties of Nature must be won. We must buckle on our armour, and make Canada what she is destined to become—one of the brightest jewels in the crown of England's Queen. Victor Hugo, in his "Toilers of the Sea," describes many thoughts which depict the fight which Canada has to wage. It is not against a foreign foe, it is not against perfidious friend; but it is the bold free fight against Nature herself—to conquer Nature by the determined will and strong arms of a free, brave, upright people.

To wrest from Nature the undeveloped wealth which is fast bound in the rocky mountains—the gold and silver, the lead and copper, the zinc and apatite, and plumbago—these are some of the works yet to be done by the modern "Toilers of the Sea." And no time seems more auspicious than the present for the great undertaking. We have at the head of the Government a man like Sir John A. McDonald, a captain who has had 25 years of experience, and we have under him a crew composed of the ablest men now in Canada, we have a new Governor, the people have declared for a new policy—the National Policy. All the old grit government and dynasty have passed away—the Hon. Geo. Brown, the quasi-dictator of Canada, has lost his power, and no one believes any more in his government, or will answer again to the sound of his trumpet, the Globe. Perhaps no fall from power has ever been greater than that experienced by the Grits. They did not know that the people were aware what manner of men they were till Sept. 17 came, and they were found out. Five years have been lost in the progress of Canada—from 1873 to 1878 the country has not made

rapid strides. Let us see what will be done in the next five years let us see what the next five years will produce. I venture to predict that in that time Canada will make more rapid strides in material development than any nation in the world. There is no reason why the Pacific Railway should not be finished to the Rocky Mountains—there is no reason why the coal and ironstone in the Owl-apple valley should not be utilised, and steel rails made in Canada out of our own iron, instead of importing them. Would it not be more sensible to import the workmen and machinery, and use our own material? Nature has placed the coal and iron together about half-way between Winneberg and the Rocky Mountains. Why should not we start a "Palmyra in the desert?"

Toronto, Nov. 25.

BOURNONITE.

#### INVESTMENTS IN FOREIGN MINING.

SIR.—In the Journal of Nov. 2 I see an article on Canadian Mining, in which it says the cause of failure is frequently the want of capital to enable them to sink deep shafts; but this is not the real cause. The true cause is that the English capitalists have too often entrusted their money to unprincipled men, who have squandered and spent the greater part in enjoying themselves without attending to the interests of the company; and, of course, when the Canadians know how English money is thrown away broadcast they will not venture any of their own. For instance, an unprincipled man agrees for the purchase of a mining property in Canada or elsewhere at a low price, never examining carefully the title to the property (of which there are a great many faulty titles); he comes to England with a plausible tale and reports from professors and mining captains upon the property; forms a private company to purchase and work the property; and he himself is appointed managing director to go out and superintend operations; but, in fact, to live a life of idleness, for he may have no knowledge of mining. This managing director often appoints his mining captain, and a superintendent of the pitwork, also a friend of his own, as purser or paymaster; all these have high salaries, whilst one man ought to do the work of the three; he overlooks all the reports, only sending home such as he knows will please the directors; horses are kept at the mine professedly to do the mine work, but are used by these four men to drive about the country on various pretences; a shaft is partly sunk, but in a wrong place; machinery is erected at a great expense, but inferior quality, as is seen by its continually breaking down; an American Diamond drill is employed, which proves unsuitable for the work, as the A.D.D. Company find out, so they throw the contract up in disgust. Then this managing director erects smelting works, but finds he has little or no ore to smelt; and as the capital borrowed is about expended he returns to England for a further loan, making great promises and excuses for not getting ore, that it is not policy to bring up the ore until the levels are made and the mine more developed; and to endorse and confirm these promises he brings home the captain, who has been for a long time laid up with the gout (or rheumatism as he calls it), brought on by some cause or other. Well may the local people smile, and say how easily the English are gulled out of their money, and what a confounding people they are.

To encourage manufacturers and open up the rich resources of Canada, the Government have been in the habit of granting bonuses and giving remission of taxation for a number of years to new works, but being so often cheated they are chary of doing so now, for many works have been commenced in Canada just for the sake of getting the Government bonus, and when that money has been received the works have shut down. Railways have been built by the Government bonuses, and afterwards they have been asked for another bonus to keep them in repair. Now, this managing director will tell his company that by a further outlay he is sure to get a large bonus from the present Government, and an import duty imposed, so that he can compete with the United States manufacturers.

If mining is economically and judiciously carried on in Canada, where the indications for ore are true, there is sure to be a profit, and the Canadians will also invest capital, but where capital is entrusted to mere adventurers, who may look to their own interest and not the company's, no Canadians will invest, as they fear failure is certain; therefore, before investing in foreign enterprises let Englishmen investigate carefully the characters of the parties employed and the indications of the country, and not trust to a plausible and glib tongue.

VERITAS.

#### ORE-DRESSING MACHINERY.

##### A REVIEW OF WHAT HAS BEEN ACCOMPLISHED BY KROM'S AIR SYSTEM.

SIR.—Perhaps no one not concerned in the manufacture of ore-dressing machinery has done so much in a journalistic way as the writer in favour of the Krom system of air concentration with the view of showing it to be a successful rival of every device hitherto employed with water as the medium. Some 20 or more columns of the Engineering and Mining Journal of this city, and nearly half that number of the capacious columns of the London *Mining Journal*, place me upon the record as an earnest exponent of the Krom system.

Prior to the publication of these articles and discussions, in the chief mining journals of the world, a pamphlet of nearly 40 pages octavo was published by me, almost exclusively made up of articles editorially written for the Colorado Herald, commanding the Krom machine to the mining public. Since then, and up to a recent period, personal effort has been unsparely devoted to the introduction of this machinery, and, doubtless, those who have invested did so partly in consequence of these publications, which could not have escaped their attention, as Mr. Krom's first imposing advertising pamphlet of 75 imperial octavo pages contains some 20 pages made up from my Colorado pamphlet and from the Engineering and Mining Journal, and very properly credited. Being thus prominently on the record as a volunteer, and without reward, or more flatly since Mr. Krom has never had a "mortgage" upon me, I am as free now to volunteer for the information of the mining public a review of what has been accomplished during eight years by some practical trials and several separating mills adopting the Krom machinery.

1.—The first practical employment of these air machines on silver ores was at Georgetown in 1870 by Mr. Bement, whose small mill was burned down, and the data of its work, as published by Mr. Krom, never has stood an expert investigation.

2.—The first practical trial on gold ores was made at Central City in 1870. The results, published widely by the Colorado Herald, as given by Mr. Krom, failed to satisfy those at whose expense the trials were conducted. The results are to be found in my pamphlet, and partly embodied by Mr. Krom in his first "Description of S. R. Krom's system and machinery for dry crushing and concentrating ores."

3.—In 1871-2 Mr. Nichols procured machinery and a contract for the territory of Utah. This machinery has never been operated on either by Mr. Nichols or by the purchasers at sheriff's sale.

4.—In 1873-4 some business men of New York furnished means for the erection of an experimental mill at Star Canyon, Nevada, which, after treating some lots of ore, was shut down, and has remained inactive since, as explained by Mr. Krom, because the mines of the vicinity were not developed, and the insufficiency of water.

5.—The results have never been given to the public. The contract required the erection of three mills, and whatever was the success or failure of this experimental mill it was tardily executed, at their risk, by engaging to supply the machinery, on limited test of saving 75 per cent., to the Manhattan Company, at Austin, Nevada. After a test run of the mill it remained mainly idle until a second test trial was made by Mr. Krom last year. His results, as published by him in the local paper, were satisfactory to himself, but failed to convince the company sufficiently to pay for the machinery or to continue running the mill.

6.—The second contract mill was erected by the White and Shilo Mining Company at Battle Mountain, the machinery supplied as before on a guarantee of 75 per cent. saving. After a test trial the mill was shut up until run by Mr. Krom last year. The company is now going through bankruptcy proceedings, the machinery unsettled for, and no reports.

7.—The third contract mill was erected by Messrs. Crook Brothers at Lake City, Colorado. After running some considerable quantity

of ores the payment of royalty was refused and subsequently compromised by reshipping all the concentrators back to New York, where they now lie in store subject to a largely reduced payment by Mr. Krom to effect their transfer into his possession again.

8.—The mill of the Clear Creek Company, at Georgetown, was erected in 1875. After running some time reports of treating from 6 to 8 tons per day have been made, the capacity being 40 tons per day. No data has ever been furnished respecting the saving.

9.—The successor of the last was erected by the Montana Mining Company, at Jefferson City. Favourable reports have been made of its running since its start in February, 1877, but no reports or data have been given, and there is rightly much reluctance to observe the contract or royalty, nothing having been paid unless very recently.

10.—Trial machinery was obtained last year by the Canada Copper and Sulphur Company. At considerable loss the two concentrators were reshipped to New York, and have lain in store for a year awaiting their redemption at a reduced price.

11.—A test machine with an outfit was procured by a Mr. Kurshed, of Fourteenth-street, and shipped to England last year. An expert chosen by Mr. Krom was sent from here, and after trial at Swansea the chief company concerned abandoned all idea of using the Krom system, and have adopted water dressing.

In despite of this unsatisfactory present condition, largely attributable to unsound business conduct, I have during the past six months proposed to interesting friends with capital sufficient to found a mill to treat experimentally a special deposit, trials having been made solely under my control with satisfactory results. This proposal was conditioned in case of a working success on obtaining subsequently an exclusive right to work or control all like deposits wherever found in the United States, my belief being that a close management, freed from the patentee's direction, with a *pro rata* royalty, and machinery furnished at actual manufacturers' cost, would re-establish the reputation of the machine. These terms had been discussed and agreed to substantially, but the execution of the detailed contract was deferred after I had interested others from time to time by Mr. Krom, until it became evident that the same bad faith, hitherto so disastrous in practice, was being used upon me and my friends, proceeding from a disregard of a business engagement entirely for selfish purposes. Had confidence remained this review of the situation would have been written only after the proposed experimental mill had failed to vindicate to the mining public the soundness of my judgment.

G. W. BAKER.

New York, Nov. 25.

#### FINANCE, MANUFACTURE, AND BRITISH MINING.

SIR.—Shareholders when unprotected by the law, or with their affairs administered and conducted by non-responsible directors—whether limited or unlimited—are as defenceless as a flock of sheep attacked by wolves, devoid of useful combination, and incapable of governing the business, or protecting their own interests. They are in the hands of trustees, and rarely enabled from the published accounts to estimate accurately their position, and the risks they are committed to; or, on the contrary, to estimate the security that exists for the continuance of dividends. In the case of the City of Glasgow Bank, with its 133 departments, we have an example of deplorable abuse; but it is not so much with this as the probabilities of other catastrophes with which we have to deal. From the columns of the Economist we gather that the published accounts of no less than 73 English and Welsh banks, with 1154 branches, show that there is 40,399,420L called up, and an accumulated reserve of 17,530,345L—say 58,129,703L—capital at command. These banks have in circulation:—

Notes .....	£27,390,448
Bills, acceptances, and drafts .....	12,508,912
Deposit and current accounts .....	235,320,087

Thus raising the total liabilities to the public and their shareholders to 333,421,212L. To meet these outstanding liabilities the assets are as follows:—Cash in hand, money at call, 61,334,223L, or just over 28 per cent. Investments in Government stocks wherein stated to be 57,318,003L—say, 17 per cent. in addition. Then comes the large sum of 210,393,129L absorbed in a portfolio of bills discounted, overdrawn accounts, loans, and varied unnamed securities ranking against the assets. Next comes buildings and sundries 4,375,857L, which absorb the full sum of 333,421,212L—i.e., paid up capital, reserve fund, notes in circulation, acceptances, bills, and commitments: the latter two sums amounting to 27,390,448L and to 12,508,912L, respectively, are simply accommodation, and which amount together to within 700,060L of the entire paid up capital of these 1154 banks and their branches. To add to this there are 45 companies, which have 240 departments of business, publishing no intelligible balance sheets, or incomprehensible, according to the same authority, having a market value of 33,259,000L, with a subscribed paid up capital 7,713,582L, having a note issue of 12,707,73L, which is simply accommodation paper. There are 139 distinct parent and branch, limited and unlimited, joint stock banks throughout England and Wales.

There is something radically wrong in the principles and conduct of joint stock banking. Merchants and contractors are daily trading with borrowed money, which fosters a game of fierce competition instead of honourable and fair trading and industry, based on capital or the deposit of actual securities in the shape of commodities against advances. The discount of merchants' and traders' bills, without being backed by products represented, are no securities for bankers, as it is well known that in financial trading the operations frequently entail in paper the market value of the manufactures or products four or five times over. Manufacturers, traders, and contractors not unfrequently lose their all, and their time into the bargain, which periodically paralyse the commerce of the country. Hence modern banking assumes all the risks—thence arises the collapse of such gigantic concerns as the Glasgow Bank, Royal of Liverpool, Barnes, and Overend Gurney and C.

The hardening of prices, the scarcity of money, and continued depression in trade are, in our opinion, the primary causes of the existing chronic badness of trade, and the consequent unhappy position of all classes of society, including large masses of the working fraternities. These spring from the prevailing facilities of mercantile and manufacturing finance which have culminated in overstocked markets for our products. Hence the large sums of money entrusted to joint stock banks mainly consist in portfolios of bills discounted, multiplied in instances over and over again, so that in fact the banks sustain mainly the risks of trade and manufacture, which is trading speculation, instead of legitimate banking as conducted by our forefathers an age or two ago; for it must be remembered that joint stock banks have sprung into existence since the passing of the Reform Bill, in 1832, the repeal of the Corn Laws in 1846, and the introduction since that advent of the principles of free trade.

In our opinion the date is not far distant when the greatest panic ever experienced in this country will spring from the entanglement and the inability of joint stock banks to meet their engagements. There are in England and Wales 1394 banking establishments, with a paid up capital of 48,313,002L, with notes in circulation amounting to 27,390,448L, just 563 per cent. accommodation. The market value of these trading concerns is somewhere near 122,485,500L. The investors in purchasing incur a risk of uncollected capital of 71,743,128L, having an aggregate reserve of 17,530,345L. Against this reserve there are bills, acceptances, and drafts outstanding at the date of the last returns of 12,508,912L, and sunk in buildings and sundries 4,375,857L, which together amount to within 645,576L of the reserves. Again, investors can secure on an average barely 5 per cent. interest, possess simply trading concerns having the profits exhausted each half-year, whilst the basis of security rests alone on future business, the nature and character of which the proprietaries know nothing of with any approach to certainty, while in the administration and conduct of affairs they exercise no control, and are wholly in the hands of non-responsible directors.

To hold shares in unlimited joint stock banks under the conviction that they are as secure as Indian stock, railway debentures and preference stocks, colonial Government bonds, and sound industrial undertakings is as fallacious and absurd as the estimate and comparison of British Consols and Spanish Bonds upon the same principles publicly.

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the City of Glasgow Bank does not call upon the Legislature to ensure Government supervision in auditing accounts and estimating assets, that other disclosures will follow, and prove that joint stock finance, not banking, is in principle and results as slippery as an eel, and as treacherous as a quicksand.

R. TREDDINICK AND CO.,  
Dealers in Stocks and Shares.

Union-court, Old Broad-street, London, Dec. 2.

P.S. (Dec. 12).—In corroboration of our views on modern finance and banking, as pursued by joint-stock banks, and expressed in our letter addressed to you on the 2nd inst., we have in confirmation of our arguments to state that the possession of simply four shares, held by the Caledonian Bank, in the City of Glasgow Bank led to the suspension of the parent and 23 branch establishments. Following in the course of these calamitous suspensions, we have to record the collapse of another aspiring bank, with no less than 49 branches in the West of England and South Wales.

Paying due regard to the published balance sheets of these two companies, no one could for a moment conceive the immediate grief to which their shareholders are subjected, and if such results follow as in these cases what security have we against the other joint stock companies and their thousand branches, and whose accounts may be founded on a basis equally misguiding and speculative in character.

The foregoing facts corroborate our views that independent *savants* are necessary in estimating assets and balancing liabilities in all joint-stock banks. In the case of the Bank of England we have weekly statements of liabilities and assets. But in regard to most of the limited and unlimited joint stock banks they are trading discount companies, and not, in the general acceptation of the term, legitimate banking institutions.

It is a well-known fact that these exceptional concerns possess 300,000,000<sup>l</sup> sterling of the surplus capital of the backbone of trade, manufacture, mining, and constructive enterprises associated with the home industries of the Mother Country; we, therefore, again reiterate that, as confidence is the breath which supports their credit, non-responsible directors and executives should be supplemented by Government supervision, or otherwise we shall have a financial panic, which will shake the very foundations of what we contend to be the false position of our present system of joint stock banking finance. It is known that 250,000,000<sup>l</sup> of bills and loans have been made by these companies. This money must, consequently, be absorbed, and the recouping of which depends entirely upon the realisation of products. Should the hardening of prices, the contraction of trade, and value of commodities, manufacture, and other products leave no margin in favour of borrowers, then the whole risks will have to be sustained by the banks. We at the same time can, by reference to the Economist and the Stock Exchange Monthly List, ascertain at a glance the margin of paid-up capital and reserve funds existing in support of the whole fabric.

#### A CONTRAST—OR WHICH PAYS BEST?

SIR.—I append two trading accounts. The formula agrees with the test we apply to the affairs of our mines and other trading concerns. The amounts are from Board of Trade Returns, and the mean of estimates by our greatest authorities upon income and labour.

I think it will be apparent to the majority of your readers that Free Trade in practice has proved itself a great bubble, and that it will soon break with terrible consequences. W. T. CORNWALL,

Birmingham, Dec. 12.

#### FREE TRADE.

GREAT BRITAIN AND IRELAND'S TRADE ACCOUNT, 1854 TO 1876 INCLUSIVE.		
DR.	CR.	Millions.
Goods bought (imports) £ 6,070	Sales (exports) £ 4,533	
Wages, salaries, rents, and profits, being estimated aggregate income 11,500	Ditto to people home account, for their subsistence £ 11,500	
Paid interest and profits on investments by foreigners, and John Bull's travelling expenses 100	Less estimated savings 575= 10,925	
Naval and military expenditure 230	Received interest and profits on capital invested abroad, and receipts from embassies and foreign travellers 200	
Bad debts 240	Gross deficiency 2,032	
Less per contra imports 150= 90		
Total £ 17,990	Total £ 17,990	
PROFIT AND LOSS ACCOUNT.		
Stock, 1854 £ 2,032	Savings brought from trade account 575	
Gross deficiency, 1876 £ 2,032	Stock, 1876 —	
	Additions to ditto, comprising railways, ships, docks, public works, and dwellings 650	
	Balance net deficiency 807	
Total £ 2,032	Total £ 2,032	
1877—To balance loss 807		

#### PROTECTION.

FRANCE TRADE ACCOUNT, FIFTEEN YEARS, ENDING 1876.		
DR.	CR.	Millions.
Goods bought (imports) £ 1,863 1/2	Sales (exports) £ 1,895	
Wages, salaries, rents, and profits, being estimated aggregate income 9,000	Ditto to people home account, for their subsistence £ 9,000	
Naval and military expenses (ordinary), and cost of embassies spent abroad 60	Less estmd. savings 675= 8,325	
Total £ 10,923 1/2	Receipts from foreign travellers and embassies 45	
	Gross deficiency 68 1/2	
Total £ 10,923 1/2	Total £ 10,923 1/2	
PROFIT AND LOSS ACCOUNT.		
Stock, 1862 —	Saving from trade account £ 675	
Gross deficiency, 1876 £ 68 1/2	Stock, 1876 —	
German war indemnity and foreign subscription to loan acct. 250	Addition to ditto 300	
Balance net surplus 6 1/2		
Total £ 975	Total £ 975	
	Balance profit 68 1/2	

#### THE GREAT NORTHERN RAILWAY.

SIR.—The failure of the West of England and South Wales District Bank following so rapidly upon that of the City of Glasgow Bank, the liquidation of the Caledonian Bank, and the delinquency of the Capital and Counties Bank, ought to make a deep impression upon all investors in railways, in the management of which they have surrendered their will, judgment, and power of independent action—in very fact, are at the mercy, in too many cases, of men acting upon principles diametrically opposed to those prevailing, or rather rendered dominant, in private industrial or commercial undertakings. The general manager of the Midland Railway truly stated to the Royal Commission on Railways in his reply to Question 16,927: "It is the sea competition to which the Great Eastern is subjected that puts that company in their deplorable state;" and as it is equally true that "qui se ressemble, s'assemblent," or in our vernacular English, "birds of a feather flock together," in which sense the Great Northern, in their impending parliamentary campaign, are making common purse with the Great Eastern after disburdening themselves of so much treasure, in this same year's pitched battle on the very identical matter—the coal transit from Yorkshire to London. The general managers of both companies gave evidence this year that they could not compete with seaborne coal, the chairman of the last-named company stating that "seaborne coal prevented their traffic by rail." Yorkshire, Nottinghamshire, and Derbyshire coal, it has been shown in my preceding correspondence, can be delivered, *via* Keadby, seaborne into consumers' premises in the Metropolis at a minimum of 5s. per ton under the cost per rail from the pit's mouth, in both cases with attendant expenses; and if we take into account return goods from London to, and *vice versa* from, the combined manufacturing districts at less than a moiety of cost per ton. Great Northern, said of a moiety of the transport cost per rail after defraying picking up, sea-freight, rail toll, and delivery charges, we arrive at an augmented saving. Great Northern shareholders will please observe that ample—nay, exuberant—data will be placed at the disposal of themselves and their experts, so that they may be penetrated with the unqualified conviction that such result is not arrived at by the undersigned or the principle of action by their company, their general managers publicly stating their inability to tell (*sic*) the working expenses

of coal traffic on their line. The Report of the Royal Commission on Railways, page 44, shows the appalling state of the system pursued in the audit of railway accounts, and the bank delinquencies set forth in my correspondence are to be attributed to the "Flexu moral" of incapacity and mal-administration. Great Northern shareholders I implore you to learn a lesson from what is passing before your eyes, and to demand a thorough investigation, and if that be refused sell out. Do not be cajoled with the "chuchotement officiel" that the undersigned is bereft of originality of thought, mental insight, capacity to grapple with technical, financial, and commercial, incipient and summarised, "comptabilité." He is no stranger to your undertaking, having had conferences with your directors, accompanied by your general manager and secretary, at King's Cross and at Doncaster. I am prepared to prove from your last printed statement of accounts that with the displacement of the precipitated traffic to Keadby and Seaborne to London, and *vice versa*, and to destination, not a farthing will be left for distribution to the ordinary shareholder. As to your assets, what do you expect to realise for your 300,000<sup>l</sup>. London, Chatham, and Dover transaction? What will become of your coal invasion lines into Notts and Derbyshire? Your goods traffic to Manchester, Leeds, and the manufacturing districts will be taken from you by daily departures from each end.

As to your Cheshire lines it is supererogatory to supplement my last week's letter. As to your Perpetual Preference Capital, Consolidated Non-Contingent Perpetual Preference Stock, Consolidated Contingent Perpetual Preference Stock, Preference Stock of 1876, and Preference Stock of 1877 dividend to accrue from July 1, 1879! Consolidated stock (Leeds, &c.) railway look ahead. Many ships have founded lately through want of a "look-out." As to your Sutton Bridge Dock investment, coal can be put on board ships discharging there cheaper in Boston Deep than at Sutton Bridge Dock. In this alarming state of commercial collapse it is the duty of Great Northern shareholders to take action.

WILLIAM JOSEPH THOMPSON.

Fitzwilliam-road, Clapham, Dec. 11.

#### ROCK-DRILLING MACHINERY.

SIR.—From the incessant importunities of Mr. Edwards we for the last time answer him through the Journal. From the lucid explanations given by us in your issue of Nov. 30, we should have thought that Mr. Edwards would have sufficient discretion to abstain from any further remarks; but, as your readers will readily perceive, he is foolish enough to imagine that we shall at some future time follow in the steps of Messrs. Schram and Dunn. If he thinks so he is fatally mistaken, but on the contrary any further repetition of his false remarks will cause us to take steps to protect ourselves, and compel him to prove the truth of his assertions. We tell him for the last time that there is no similarity between the Eclipse and Edwards' drills, and consequently not so in their specification. Mr. Edwards can make as many drills as he pleases from his patents of 1874 and 1875, but in doing so he will not be making anything like the Eclipse drill. We are also satisfied that Mr. Edwards does not understand the structure of the Eclipse drill, and we scarcely think his own, for we again repeat that his valve is governed by the live steam and not by the exhaust.

Mr. Edwards would, perhaps, like to see some other person do what he has not the courage to do himself—to attempt to make the Eclipse drill. We are perfectly satisfied of the validity of our patent, and are prepared to uphold it against the world, and any trap-trap Mr. Edwards may have said or wish to say will not deter us from carrying into effect the warnings we have already given.

London, Dec. 10.

HATHORN AND CO.

#### ROCK-DRILLING MACHINERY.

SIR.—Perhaps unknown to himself Mr. Edwards has answered the questions I put to him. I now know positively that he not only never made a rock drill with a valve like the Eclipse, but that he never conceived the idea. His twaddle in last week's Journal must go for what it is worth, certainly not the paper it was written on. As to the model he pretends to have made, I defy him to produce it.

Wandsworth, Dec. 12.

WM. THOMPSON.

#### ROCK-DRILLING MACHINERY.

SIR.—Kindly insert a short note in reply to Mr. Edwards' side-wind of last week. That very clever gentleman would like to make your readers believe that no other person but himself is any judge of inventions or their designs. My experience is not by any means confined to the Eclipse drill, for I am quite sure that my knowledge of such machines dates back much further than that of Mr. Edwards, and certainly is of a more permanent character, as I am fully convinced that his knowledge is founded upon paper, not practice. I commenced in the United States with the Burleigh, and it was there I first saw the Ingersoll, which I again saw in this country on my return three years ago, since which time I have had opportunities of seeing nearly all the drills that have been offered to the public, among them being the Eclipse and Edwards' drill, the latter as exhibited at the Victoria Docks. Again I say that there is no similarity between the two drills, and however much Mr. Edwards may try to shield himself from the accusation of taxing other people with pirating his ideas, that fact still remains. As to bringing his drill before the public in his own fashion, I do not see that anyone has attempted to prevent him doing so, but still he cannot shut people's eyes as to his intentions in regard to other rock-drill proprietors. It looks bad to say the least of it.

GEORGE COOK.

Millwall, Dec. 10.

#### ROCK-DRILLS AND AIR-COMPRESSORS.

SIR.—In my letter of Nov. 27 I said nothing that I believed to be untrue—in fact, on inference I still assert it despite the remarks of Mr. H. Williams and Mr. Henderson.

If the Brydon and Davidson's machine were a new one, why did not Mr. Williams tell your readers the machine had neither been opened or examined for 12 months, and that the packing was altogether out of place, and prevented its working?

The second contradiction I give Mr. Williams is that as Mr. Hosking who showed the McLean said before the machine started—"I brought this machine here to let the people see a McLean's drill which has done a lot of work, not that it is fit to exhibit." The Barrow had equally done a lot of work, and never was intended as a competitive trial, and there was none. The stones in the ground have been examined by two gentlemen well able from experience to judge of the comparative hardness since the trials, and they can see no difference—in fact, they were taken from the burrows for their size, as affording a steadier base to operate upon, and not for any difference in hardness or softness. There was no difference in the quality, and none but a novice or one anxious to misrepresent facts would assert it.

Every borer or chisel except the Eclipse drilled a hole exceeding 1 1/2 in.; the borer of the Eclipse was much smaller, diminishing as every child knows in its downward progress. Mr. Williams' statements are alike true throughout and of a piece when he says—"H. W." is either the proprietor of some rival machine, or strangely interested in one." False throughout. "H. W." has no interest in any machine direct or indirect. His interest is to see fair play, and good machines not condemned by pretentious "toys" and small bellows compressors at extortionate prices.

Mr. Henderson, in his blindness of first love, tells us they drove nearly 7 fms. during the first month. He does not say that there are men who would have driven the ground during that time at 6 ft. a fathom, and at no time during the 7 fms. driving has the ground exceeded 9 ft. per fathom. That they with their pretentious Eclipse have not exceeded hand labour. Mr. Henderson and his friend Williams are alike ignorant of what is doing at New Cook's Kitchen, where Ullathorne is driving 3 fathoms a week. Of one we hear nothing, but the other would not be heard, save as a barndoof fowl crowing on his own dunghill. That the Eclipse drill has proved its resistance to wear and tear by the hard ground in West Basset is the greatest twaddle one can be asked to hear. They have had nothing like hard ground yet.

"H. W." has no desire to prejudice any machine, but has taken an interest in machines years before Mr. Henderson saw one. It is the unqualified pretensions to superiority, to the condemnation of superior machines, that "H. W." has entered his protest as a warning to the adventurers who may entertain the question of boring machinery. They who feel an interest have only to go to Dolcoath, Carn Brea, Wheal Agar, South Crofty, or West Tolgus to determine which is like business. The most inexperienced miner in Cornwall will tell you which is the toy and which is the useful machine; the latter will bear comparison with the costly toy and bellow so much lauded.—Dec. 11.

H. W.

#### DEVON SILVER-LEAD MINE.

SIR.—I beg to say, in reply to your correspondent "C.E." that the valuable lode in the Devon Silver-Lead Mine is not, I believe, bounded by the measurements I gave, but as I always prefer under-stating a case of this nature, I gave the known rather than venture on a statement of the unknown, and in this instance the facts I have given so fully demonstrate the immense value of the mine that it is not a material question whether the lode is or is not many fathoms more. The lode I described has been bared, and only wants winning. I have received a letter from another gentleman, who is surprised at the statement about the quantity of lead and silver in the halvans. It certainly does seem to any outsider an incredible thing that so much valuable mineral should be lying in the halvans, but inasmuch as a considerable part is not patent to the eye until the stuff is washed, and from the fact that the mine has yielded so much produce, we know miners often throw away valuable mineral, and in large quantities, when they have plenty of bulk to take at. The other lodes to which I incidentally referred, and which I assigned with the machinery to be put up by a company, as a bonus, will in all probability be as productive as those which have been worked. I think it is only fair and right that the purchasers of this mine should have every advantage given them on a liberal scale. Of one thing I am certain—that on the revival of trade, and when the halvans and lode have been dealt with, the purchasers, if inclined to resell, will have no difficulty in realising twice or three times the amount of 5000<sup>l</sup>.—the present purchase price. In dealing with the halvans I have estimated the lead at 1 1/2 ton per fathom instead of 2 1/2 tons. The silver I have estimated at 20 ozs. per ton instead of the immense percentage shown by the careful assay which was made. Here again is an element which I think a spirited purchaser should have the benefit of, and "C.E." will at once see that I have thrown to the purchasers far more in value than the price asked. The Devon Silver-Lead Mine is a sound and healthy adventure, and whoever becomes the fortunate possessor will, I am sure, find ample confirmation of everything I have stated.

If your correspondent "C.E." has any further questions to put I shall be happy to give him every information. Much injury has been done in the past to mining matters by exaggerated statements and selling mines at too high a price. The seller is entitled to a fair price, but it is the worker and developer of the mine who should have the lion's share. By this means mining would be put upon a sound and healthy footing. Success in this, as in every good mine, would inspire public confidence, and we should soon hear less of winding up. Let the character of a mine never be over, but under, stated, and then personal inspection will invariably confirm what has been stated. As several of my friends have written to me on the subject, assuming me to be the writer, I will, with your permission, drop the *nom de plume* for the future, and subscribe my name.—Ulverston, Dec. 11.

WILLIAM SALMON.

#### DEVON GREAT CONSOLS.

SIR.—In referring to recent events in connection with the above mines I stated in my last letter to the *Mining Journal* that "throughout the conflict between the authorities of this company and the men, with regard to the five-weeks month, the full working expenses were constantly brought prominently forward, whilst the great reserves of manufactured arsenic were kept in the background, and that the mines were represented as being worked at an enormous loss; when, at the same time, it was clear to the men on the mines, and to those residing in the district who witnessed the large accumulation of this valuable commodity in store, that, calculated at the ordinary market price, the mines were plainly working at a good profit." In confirmation of this statement it was officially announced at the recent meeting of the company that the stock of arsenic had been sold, and that the money borrowed, amounting to 6000<sup>l</sup>. would be paid off. To discharge this balance of 6000<sup>l</sup>. the sale of about 1000 tons of arsenic will probably be

of the vast underground operations, from which resulted such enormous wealth to the proprietors.—*Dec. 11.* **MEMORABILIA.**

The mines are near New Bridge, in Devonshire, about five miles from Tavistock, extending from the banks of the Tamar eastward about two and a-half miles, and about half a mile in width. They are worked in killas or clay-slate, near the junction of the granite. The mines were first worked to a limited extent without success. Operations were resumed in August, 1844. At the end of the first year dividends had been paid out of profits to the amount of upwards of £73,000.; and before the end of the second year 17,000 tons of ore had been raised, and sold for £120,000. Up to April 20, 1877, the mines cost amounted to 1,528,531. 6s. 11d. Copper ores had been sold—tons, 609,280; value, £3,226,426.; and arsenic about 15,000 tons. Total dividends paid £1,195,520., and dues to the lord of the manor about £240,000. These important results have been obtained by surface-works covering an area of 140 acres, including seven acres occupied by the arsenic works. The surface-works consist principally of dressing-floors for preparing the ores, steam-engines, and water-wheels for pumping water, lifting ores to surface, and for crushing and preparing them for the market. There are five large water-wheels worked by the River Tamar, two of which are 40 ft. in diameter, and 12 ft. breast; these together pump up many thousand gallons per minute on an average of 300 ft. perpendicular height. The water is used for dressing purposes, and for moving other water-wheels on its way back to the river. The leats carrying water are eight miles in length. There are, besides, nine powerful steam-engines and two locomotives. The underground works are reached by 18 shafts, through which the miners travel to their work by footways, and by two man-engines. The greatest depth attained is 1740 feet. The levels and adits are nearly 40 miles long, traversed by six miles of tramway. There are extensive precipitate works for obtaining copper from the water pumped out of the mine, in which it is found in the proportions of 4 grs. to 7 grs. per gallon. Although this quantity may appear to be small many tons of metallic copper are obtained annually. For the provision of tools and the maintenance of plant there is a foundry and fitting-shop, provided with lathes, punching, shearing, and screwing machines, and steam hammer, &c. The present monthly sale of copper ores is about 900 tons, and of arsenic about 200 tons. The number of persons employed is 800 men and women, boys and girls.

#### GOLD IN WALES—THE CLOGAU MINE.

SIR.—In connection with the recently reported discoveries of gold in India, it may not be out of place to give the following returns of gold obtained some 26 years ago from a gold mine in this country—the Clogau.

	Ore crushed.	Pure gold.
	Tons cwt.	Ounces.
1861—January...	0 2	63
February	28 11½	171
March	40 18½	189½
April	38 5	161½
May	24 18	181½
June	32 4	142½
July	28 2	257½
August	13 6	144½
September	61 2	304
October	54 18	358½
November	58 5½	363
December	75 4	546
Total	Tons 455 0	Ozs. 2884
1862—January...	53 7	400
February	67 15	463
March	71 18	529½
April	62 13	566½
May	88 14	759
June	72 13	641
Total for 1862 ...Tons 417 0	...Ozs. 3360	

Thus in eighteen months actual working 873 tons of quartz produced 6244 ozs. of gold, sold at 37. 18s. per ounce, and realising upwards of £24,000., the expenditure during that time being under £3000. There can be no doubt of the richness of at least some of the Merionethshire gold mines, but the misfortune has been the reckless expenditure on all sorts of useless machinery. We cannot do better than quote some observations of Prof. Warington Smyth, from the Mining and Smelting Magazine for June, 1862. ".... Some may call it a bubble, but I cannot, inasmuch that gold was found visible at hand in a number of different veins, and that the real value of it has never been fairly proved. Thousands of pounds were spent on what? Surely not in working for the ore, for there are only two or three instances where the rock has been fairly tried, but rather in building in the air, in inventions, letters patent, by people who never saw a gold work properly worked; and while the worth of hundreds, perhaps thousands, of pounds of gold was carried away as specimens, or with the excuse of proving it on a grand scale, Her Majesty, the possessor of the royalty, was literally robbed of her portion. This was followed by a space of non-payment and ruin of character in which Nature, in the name of the Welsh gold province, had to suffer, for a great part of the disgrace was left to fall on the guiltless neighbourhood that should have fallen upon the mischievous strangers who pushed across the country to Wales."

Some recent experiments have, we understand, resulted in the discovery of auriferous sand in large and payable quantities in the ancient bed of the River Mawddach, and some valuable reefs have also been found in the same neighbourhood; this, coupled with the continued productiveness of the Clogau Mine, is likely to draw attention again to the gold mines of Merioneth, and it is to be hoped that the follies of former years may not be repeated. C. H. S.

#### CARDIGANSHIRE MINES—CENTRAL DIVISION.

SIR.—It is only a few months that the Cwm Brwyno Mine has come into the hands of the present company, and it is most gratifying to say that in that brief space of time enough has already been done to secure to the fortunate shareholders a lasting and permanent success. No mine stands in better position than Cwm Brwyno, being situated in the centre of all the best mines ever worked in the county, and being nearly 1000 ft. higher than the Goginan Old Mine, although distant scarcely more than 1½ miles from it, and it has the advantage of being supplied by the same reservoir, which, together with water-courses leading into them, cost some thousands of pounds to complete, and will be ample to put the workings at Cwm Brwyno to a depth of 200 fms. under adit, and to return, crush, and draw 300 tons of lead ore per month, and it is most fortunate that this is so, for I speak practically, and from knowing the mine and its connections for nearly 40 years, that this result as to returns will in less than two years be realised. It will not be expected in a letter of this sort that I should go into minute details of how and when this ore is likely to be obtained; I mean from different bargains let at the mine, which could only be got at by different quantities capable of being broken from the several bargains let. I will, therefore, only speak of the ore ground now available, and, in the first instance, will mention that the 80, east of engine-shaft, has entered a course of lead ore which has not been worked under the 56, and which there yielded from 2 to 3 tons per fathom. The length of this ore ground in the 56 was about 20 fms., but at the 80 it has been found nearly 15 fathoms further west than in the level above, and as the dip of the ore over the 56 did not show a westerly dip, it shows that this course of ore is increasing in length. There is also ore ground available for profitable working behind the present forebreast for 20 fms. long, with a back 24 fms. high. Under the last ore ground mentioned in the 92 the ore within the last month has been found better than in the 80.

In the 92 west there is a course of ore gone down in the sole, which for 10 fms. long will produce more than 3 tons per fathom, and beyond that distance the ore gone down in the sole of the 80 fm. level, and worked from there to surface for 100 fathoms long, has not been seen in the 92 west, and strange to say there was never a winze

put down under the 80 fm. level to prove this ore ground. In the 104 east a good deal of the ore ground has been taken away, but still there are large bodies of ore before the present forebreast, whilst the 104 fm. level west has never been driven 1 fathom westward towards the ore gone down from 20 to 30 fathoms west of engine-shaft richer than any part ever worked in the mine. By extending this level west it should pass through rich ore ground 130 fms. long. The engine-shaft has been sunk 4 fathoms under the 104, but this need not be deepened for some time to come, as the ore ground referred to should be laid open and proved previous to proceeding with this work. The Powell United lode runs through this sett and to the south of the lode worked, and may be proved 50 fathoms east of the Cwm Brwyno engine-shaft for a 50% note at any level the company may decide on, whilst 100 fathoms west of engine-shaft there is as fine a lode as the Cwm Brwyno vein, which can be reached at the 80 under adit in 7 fathoms driving north at a cost of 42s.; and as these two veins run through the property for 1½ mile untouched and untried I do not think I have taken an over sanguine view of the results likely to be obtained by the present company. If 25000. is expended, as recommended by the managing director, in erecting improved dressing apparatus, and in putting in a double skip through engine-shaft, so as to have ample drawing power, it is more than probable this property will pay cent. per cent. on a capital of 30,000. during the whole term of the present lease; and as the prospectus will be issued in a few days I would advise capitalists not to lose so favourable an opportunity for a safe and profitable investment—advice which I have acted on myself. **ABSAJOM FRANCIS.**

*Aberystwith, Dec. 11.*

#### THE ROOKHOPE LEAD MINING COMPANY (LIMITED).

SIR.—As a large shareholder in this company I was present at the annual meeting held this week, and I wish to point out more exactly than has, I think, been done how the increase in its assets to the sum of 315. 15s. 6d. arises. It is due to—

1.—The fall in the price of lead. This fall in the sales for the financial year averaged 17. 13s. 5d. per ton. The total loss on this head is 568. 1s. 8d.

2.—The fact that for three months—that is, from about September to December, 1877—"the returns were almost wholly suspended," while the expenses were somewhat increased. This was caused by the appointment of a dressing agent of high theoretical knowledge, who wholly failed to benefit the company, and who did not resign for three months. The loss under this head was at the meeting stated to be upwards of 1000.

3.—The expense of constructing reservoirs. This has been effected at a cost of upwards of 300., and will be of considerable use to the company.

4.—To the carrying on vigorously of exploring works and the decrease of stoping. The cost of the former is, I believe, nearly double that of the latter. In fact, and possibly to too great a degree, the lead has been left standing on account of the low price it commands, although it could be extracted to pay costs, and I believe something more.

From this it will be seen that the decrease in the assets of the company is due mainly to an exceptional cause—the blunder of appointing a theoretical dressing agent. Had this blunder not been made the actual loss, apart from the sum expended out of capital to construct reservoirs, would have been only 568. 1s. 8d.

It should I think be carefully borne in mind that this company possesses two very valuable lead-mines—Brandon Walls and Thorney Brow. The former of these was worked to some extent by the old company. The sale of either of these mines would add a considerable sum to the company's assets.

It is also an important feature in reference to the company's future to note—1, that it was stated by Mr. Blenkinson, the company's agent, at the meeting that since his connection with the mine, a period of upwards of three and a-half years, no lead had been taken away from any ground opened up by him; 2, that upwards of 2000 tons of lead has been discovered by explorations; and, 3, that the rich piece of ground between the 25 and the 42 fm. levels, of which so much has been said, still remains to be tested.

The fixed expenses of this company amount to about 5000. a year, of which 2500. represent salaries paid to five directors, who take the greatest interest in the mine. I venture to suggest that three directors, at a salary of 50% a year each, would be a number amply sufficient for practical purposes. I venture, also, to suggest that in estimating monthly profits or losses it would be more satisfactory if the proportion of dues and of the fixed expenses were included as part of the costs. It is not mine costs, but it is shareholders' costs, as they well know. Statements as to the profits a mine is said to be making would then be thoroughly reliable, or if there were losses shareholders would know the worst.

I believe, Sir, that the mine is now being worked most efficiently and economically, and will now pay all costs—not mine costs merely; and with a rise in the value of lead will prove a great success, and pay good and lasting dividends.

*Dec. 7.*

#### LARGE SHAREHOLDER.

#### THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week markets have been depressed by the Bank failure in the West of England. The fortnightly settlement now in progress tends to restrict business, and particulars of the continuation business done are given below. The account just commenced for settlement December 30 is the last one of the year, and generally a quiet one. The improvement which might have been expected in the markets from the decided improvement in foreign affairs, and the general satisfaction felt at the pacific tone of the Queen's speech, has been more than neutralised by the tightness of the money market, owing to the renewal of distrust, and the stagnation in trade. Though the Board of Trade Returns for November show continued decreases in the values of British imports and exports it is noticeable the quantities are not so much reduced, and they present a few other redeeming features. The great reduction in imports is in coal and other articles of food, which thus tends to cheapen production, and so stimulate consumption. Again, the decrease in imports is greater than in exports, so stocks will be worked down to be more nearly on par with consumption. Thus trade will gradually become sounder, and confidence revive, when no doubt commerce generally will begin to get brisk again.

In shares of coal and iron companies shorts have fallen 5s. per share; Bolekow, Vaughan, A, 2½ 10s.; Ebbw Vale, 1½; Glasgow Port, Washington, 8s.; Marbella, 5s.; Monkland, 4s.; also Omroa and Cleland, 2s. 6d. On the other hand, Benhar is 1s. higher per share, having recovered from 1s., to which they fell in the beginning of the week. There is not much business doing in them pending issue of the investigation committee's report, but a meeting of the shareholders in the West of Scotland is to be held privately, when it is stated that gentlemen well informed as to the position of the company will make known a few circumstances that call for consideration in order to protect the interests of the shareholders. A call of 3s. has been made, payable Jan. 10, 1878, on the new 10s. shares of Sandwell Colliery, which will then be 8s. paid up. As there are 3125 of these shares, the capital thus will be 9375s. Andrew Knowles and Sons (20s. paid) are 9s. 6d.; ditto (25s. paid), 12s. Bilbao, 19½; Bolekow, Vaughan, A, 49 to 50; ditto, B, 29 to 30; Cardif and Swansea, 20s. Charles Cammell and Co., 13s. Chapel House, 7½ per cent. debentures, 7 to 9; Chillington, 45s. to 55s. Ebbw Vale, 75s. to 80s. Great Western, 40s. John Brown and Co., 25 to 30s. Munt's Metal, 60s. prem. Newport Abercarn, 75s. Parkgate, 21s. Pelsall, 11s. Rhymney, 11s. Sandwell Park, 15s. Scottish Australian, 30s. to 35s. Sheepbridge, 30s. Staveley, A, 6s. 6d.; ditto, C, 5s. South Wales, 45s. Tredegar, A, 9s. West Cumberland, 7.

In shares of foreign copper companies Cape shares are 10s. higher, but Tharsis are reduced 2s., and Rio Tinto, 7 per cent., 11s. 3d. English and Australian are at 20s. Huntington, 10s. to 15s. Rio Tinto, 5 per cent., 5s. Virneberg, 40s. Yorke Peninsula, 2s. 6d. to 3s. 6d.; ditto (pref.), 10s. to 15s.

In home mines the market is very quiet. Glasgow Caradon are 2s. 6d. lower, and the next sale of this company (computed 200 tons) will compare with 220 tons last month and 205 tons in December, 1877; in previous years, when copper was at a remunerative price, larger parcels were sold. The shares are lower, on a fall of 2s. in that metal. Shares in the new company—Cornwall Mining (Limited)—being payable at three or four months, and few in number, and at a low price, continue in request, and are being quickly subscribed for. The setts is, undoubtedly, very valuable for silver-lead. Bodmin shares are still offered at low prices (10s. to 12s. 6d.), although it is stated that they expect a great improvement some time next year; but it is as well not to forget that "one far off have long horns." Bamfylde are at 5s. East Van, 40s. to 45s. Great Laxey, 17½ to 19s. Gunnislake (Clitters), 10s. to 20s. Killifreth, 1s. Llanrwst, 15s. to 20s. Parys Mountain, 5s. to 10s.

In shares of gold and silver mines, Australasian shares are reduced 2s., and Richmond, after being 11½, buyers are 1s. 3d. lower on the week, at 11. Operations are progressing at the United Mexican, and small quantities of ore continue to be got. The Pestateira United gold returns for November are 344 ozs., from 714 tons. The last fortnight's run at Almadia and Trito is £3000, and the meeting will be held on Dec. 20. The Chicago Silver meeting will be held about Dec. 28. Birdseye Creek are at 14s. 6d. Chontales, 10s. Cedar Creek, 2s. 6d. to 5s.

Colorado, 40s. Don Pedro, 7s. 6d. Eberhardt, 70s. Exchequer, 2s. 6d. to 5s. Flagstaff, 3s. 9d. to 5s. 9d. Frontino, 1s. 3d. Gold Run, 2s. to 6s. L. X. L., 2s. to 4s. Javali, 8s. New Zealand Kapanga, 11s. 3d. Port Phillip, 10s. St. John del Rey, 28s. South Aurora, 2s. 6d. to 5s.

In shares of oil companies, Oakbank are 6d. higher and Uphill 1s. lower.

Young's Paraffin have been steady at 13½ cum dividend to 12½ ex dividend. The dividend on these shares is 14s. 10½d., payable Dec. 22, and that on Oakbank 1s. 6d., payable Dec. 13. Runoon Soap and Alkali, 11 to 10 d.

Shares of miscellaneous companies are idle. Native Guano remain at 8s. United 2s. 6d. prem. Bristol and South Wales 7½; Gloucester 7½; Midland 13. Metropolitan 40s. prem. North Central (fourth issue) 30s. prem. Railway Carriage 85s. Limps, 25s. Prices of Wagon companies shares are:—Birmingham 15½; Bristol 16s. 6d. prem. North Central 16s. 6d. prem. Railway Carriage 85s. Langdales, 82s. to 87s. 6d.; Lawes, 8½ to 9; Newcastle, 38s. 9d.; and Northern Agricultural, 8½ to 9½.

**CANADIAN COPPER AND SULPHUR COMPANY (Limited).**—At an extraordinary meeting of this company last week the Chairman

moved that the company be wound-up voluntarily, but a considerable number of London shareholders were present, and opposed this motion successfully. The company is, therefore, to go on. The Chairman said that they had paid all the exploration at Acton out of their Capleton operations, and something over. They had now stopped at Capleton so that further operations at Acton might result in reducing their surplus in hand. The report made by the manager as to Acton was not sufficiently satisfactory to warrant them going to any further expenditure. Further operations might result in a loss of money. The directors were strongly of opinion that the surplus now held was not too much to put into a liquidator's hands with the view of preventing his being forced hastily and in bad times to realise the assets of the company. The chances were that within the next few years there would be a revival of trade in Canada, and all over the world, and when that occurred there might come a speculative time for these Canadian properties, many of which, although not doubt never worth the sum originally paid for them, were *bona fide* copper producing properties. In consequence of this turn in the company's affairs different to the recommendations of the directors it is probable that a new board will have to be elected soon.

**HUNTINGTON COPPER AND SULPHUR COMPANY (Limited).**—A circular issued by this company states that a well attended private meeting of shareholders was held recently, by advice of counsel, to receive information as to the state of the case pending against the original directors and promoters. The Chairman stated that the action of reduction raised in the Court of Session to overturn the decision as to voting at the last special meeting of the company, would shortly come on for hearing, and that it was considered advisable that a fund should be raised, not only to indemnify the directors against any personal liability in connection with the company's affairs, but also to show that their policy was approved by the independent shareholders. The directors agreed to give 10s. per share to raise this fund, and the other shareholders present on average 10s. to 7s. per share, and it is to be hoped all the independent shareholders will approve of and join in this proceeding. As the money may not be required at all, it will only be necessary to give a promissory note for whatever amount each subscriber.

The following calculations show the yield per cent. on the money invested at present in the shares named, based upon the last average yearly dividends being maintained:—In coal and iron companies,

Andrew Knowles and Son would pay 13s.; Bolekow, Vaughan, A, 5½; ditto, B, 5½; Charles Cammell and Co., 8½; ditto, 6 per cent. debentures, 6s.; ditto, 5 per cent. debentures, 5; Harry Briggs, A or B, 3s.; John Brown and Co., 7½; ditto, 5 per cent. (pref.), 5; Parkgate, 3s.; Staveley, A, 7½; ditto, B, C, and D, all 6½; and ditto 5 per cent. (pref.), 4s. In wagon and rolling stock companies, Birmingham 9s.; St. John del Rey, 11½; and Val de Travers Asphalt Paying, 9s.

**BINNEND OIL COMPANY (Limited).**—This company was floated in July last, and full particulars of it will be found in the *Mining Journal* at the time. It has already been considered desirable to appoint a committee of investigation, and they are now engaged in looking minutely into the affairs of the company. At the last (and first) meeting of shareholders the directors stated that the applications for the shares had been numerous, and 8700 were allotted to persons other than the vendor, Mr. Simpson, and to him, in accordance with agreement, were allotted 4300 shares. Thus the whole capital of £30,000. was raised. After the allotment the directors discovered that a number of the applications made in the names of third parties were truly made for behalf of Mr. Simpson, or under agreement with him to accept a transfer of the shares if and when required by the applicants.



and the reason why the shareholders capital was only now on the point of becoming productive was that very much time and labour had been expended in remedying the defects of the old press and in maturing the new one. Every effort had been made to keep down the expenses; the directors at present were giving their services without remuneration, and with these and other economies the directors believed that if a small sum could be borrowed on a mortgage of the company's English patents it would be unnecessary to raise any fresh capital. As to the German patent, there was still the probability of its being sold, and the purchase-money of this would suffice not only to pay off the proposed mortgage, but to provide the company with a good working capital. The directors were very happy to inform the shareholders that the Commissioners of the Paris Exhibition had awarded a bronze medal to the company for the press they had exhibited. In conclusion he (the Chairman) moved the adoption of the report and accounts.

Mr. KENT seconded the resolution.

A very long, and occasionally personal, discussion ensued, and some of the shareholders complained that the directors had not shown sufficient energy and discretion in the mode they had adopted for pushing on the completion and introduction of the machines. In reply, the CHAIRMAN ably defended the action of the board; he pointed out that many improvements had to be made in the press after its acquisition by the company, and concluded that, under all circumstances, the directors had done the best they possibly could for the shareholders. The adjourned meeting was held on Dec. 5, when Mr. BOWING, the patentee, and who had also had the management of the construction of the presses, replied to the observations which had been made regarding himself at the previous meeting and also explained generally the reason why greater progress had not been made. It is not necessary to go at length into Mr. Bowing's explanations, many of which referred to details, and others to personal matters. In the discussion which ensued a general impression seemed to exist that the company really possessed a most valuable press, and that the great point to be aimed at was to complete one or two machines and get them successfully to work, and thus demonstrate to the public the thorough success of the invention. In reply to a question, Mr. BOWING said he hoped in a very few weeks to get the Stoke press thoroughly finished and in working order.

In the end the following resolution was passed:—"That this be adjourned for three months from Dec. 5, the board in the meantime to confine their attention to the completion of the Stoke and Hull presses; but if those presses, or either of them, be completed at any date previous to the expiration of the three months, the board shall summon the adjourned meeting of shareholders forthwith."

A vote of thanks was then passed to the Chairman, and the meeting adjourned.

#### THE GLYN LEAD MINING COMPANY.

At an extraordinary general meeting of shareholders, held on Friday, Dec. 6, at the registered offices of the company, Coleman-street Buildings, the resolutions passed on Nov. 20 were confirmed.

These resolutions authorise the creation of 24,000 new ordinary shares of 1/- each, considered as fully paid, to permit the completion of contracts with W. Sturge, E. T. Sturge, A. J. Norris, L. Lewis, W. Francois, and P. Jones, such shares to rank with the 11,000 original ordinary shares as to voting, dividends, and winding up. Further, 17,500 10 per cent. preference shares of 1/- each are to be created—deficiencies of one year to be made good out of profits of six recent years, and in the event of winding-up with surplus assets such preference shares to be repaid in full before ordinary shares come in. The directors are authorised to issue the preference shares in any manner they may think fit. The name of the company is to be the United Van Consols and Glyn Lead and Barytes Mining Company.

The following report as to the mine was read by the secretary to the meeting, which considered it highly satisfactory:—

*Van Consols and Glyn Mines, Dec. 4.*—As requested I have very carefully taken the various bearings of the outcrop of the Van Consols lode, from the river or western boundary of the set to the eastern boundary of the Glyn Mine grant. Thence through Penyel's set to the Van Mine, the average bearing of the lode would traverse the butten some 50 fms. south of St. Eane's engine shaft on 90 fms. and upwards, from the outcrop of the lode in that property. I have also taken the bearings and distances from the entrance of the Van Consols adit north to the north lode, and find them to be 8 fms. asunder. This lode underlies south, and apparently at the same angle as that of the Van Consols lode, and which, no doubt, will run parallel with it throughout the property. I may add here that a level has been driven some 7 fms. east on its course from the margin of the river, therefore it is not under much cover yet; nevertheless, it is well defined, and consists of matrices essential to the production of lead. If driven on into the hill, the altitude of which I have ascertained, it would soon be under a cover of 96 fms., when in all probability large quantities of lead will be found. There is a well-defined cross-course interesting the lodes in the western part of the property, and against which, east and west of it, Van Consols lode produced thousands of tons of lead. On the cross-course alluded to some years ago a level was driven north at the adit level 46 fms. from the Van Consols lode towards the north lode, with a view of testing its character and value. For want of funds that object was never attained. There still remains some 45 fms. to drive. The ground is easy for excavation, and requires but little if any timber to support it; therefore, the remainder of drivage would be effected for 4/- per fathom. I think that would be the maximum price. This matter is well worthy of attention. From the direction indicated by compassing the north lode is in a line with the lead-producing vein in the Great Van Mine, which is still abundantly rich.—JAMES ROACH.

MR. THOMAS (the Chairman) made some valuable explanatory remarks upon this report, and thoroughly endorsed the opinion stated in it, and expressed his confidence in the future of the united company. A cordial vote of thanks to the Chairman was passed.

#### EMMA SILVER MINING COMPANY.

The annual general meeting of shareholders was held at the City Terminus Hotel, on Tuesday, Mr. MACDOUGALL in the chair.

The report, stated that the claim against Messrs. Bischoff, Bompas, and Bischoff, the original solicitors of the company, for the sum of 2000/-, received by them from Mr. Albert Grant, had been amicably settled by those gentlemen expressing their willingness to refer the matter to the arbitration of Mr. Day, Q.C., in accordance with whose award they had paid to the company the sum of 2000/. The claim against Messrs. C. F. Kemp, Ford, and Co. for moneys received by them in connection with the promotion of the company had been settled by the payment by them to the company of the sum of 1500/. The claim against Mr. George Anderson for the return of his qualification shares was contested by him up to the actual day of hearing of the case, when, without offering any defence, he submitted to judgement being signed against him for the full amount claimed and costs—2460/- 10s. 10d. The directors thought it was a matter for observation that the company was thus exposed to every possible expense and trouble, for upon application being made for payment of this judgment debt, Mr. Anderson called a meeting of his creditors, at which he submitted a statement of his affairs, according to which there were, practically speaking, no assets. With respect to the proceedings in the English Chancery Courts against the vendors and promoters for a rescission of the contract, breach of trust, and the return of moneys taken by the promoters without the knowledge of the company, the directors reported that the American defendants, Park, Baxter, Stewart, Schenck, Lincoln, and the Emma Company of New York (the vendors), had not appear to the action, although they had been duly served, and though the company was entitled to ask for judgment by default against them, such judgment would be of no practical avail so long as these defendants kept themselves beyond the jurisdiction of the English Courts; consequently, (Mr. Puleston having settled the company's claims) the proceedings in Chancery were practically confined to the claims against Albert Grant, Maurice Grant, and George Anderson. In these circumstances the directors thought it best (with the approval of counsel), upon Mr. Albert Grant's applying for a commission to take evidence in America (which would have involved great delay and exposed the company to very great expense), to apply to the Master of the Rolls for permission to confine the issues to be tried, so far as the defendants Albert and Maurice Grant were concerned, to the questions, "Were they promoters?" and "For what profits are they responsible to the company?" This application was strongly opposed by these two defendants, but the directors having undertaken to abide by the result of the trial of these two issues so far as these two defendants were concerned, the Master of the Rolls ordered that the cause should be put down for trial at once upon these two issues. The amount claimed by the company from the defendants Albert and Maurice Grant under these two issues is (including interest) about 200,000/. With respect to the proceedings in the American Courts, they comprised an appeal from the verdict of the jury in the Common Law action presided over by Judge Wallace and a Chancery suit for rescission and breach of trust agaist the vendors—the Emma Company of New York—and Park, Baxter, Stewart, Schenck, &c. They were satisfied with the progress of this suit.

THE CHAIRMAN, in moving the adoption of the report, said they had nothing to report upon mining matters, and with regard to legal matters they were for the most part *sui judicis*. As regards the reports and accounts of the Gardiner board, they recommended that they should not be adopted until certain matters were investigated by the shareholders. With regard to their action against Messrs. Lewis and Son, the metal-brokers, referred to in the prospectus, it was on two grounds, the ground of conspiracy—that they conspired with Grant and Park to foist this mine on the British public, and in support of this ground they produced such evidence that the jury could not agree. The other part of their claim was that Messrs. Lewis and Son, as promoters of the company, received about 4000/-, which with interest had since amounted to 8000/-, and the jury found a verdict for the company on this ground, and at the end of the trial in June last Mr. Justice Denman would not enter judgment on the verdict of the jury until he had heard the arguments of counsel. He did not hear these arguments until Nov. 27, and as they were taken on Saturday, they expected to have six more Saturday's arguments.—MR. ROMANES (a director) seconded the adoption of the report, and the motion was carried unanimously.—The directors were then re-elected, and in reply the CHAIRMAN said when they took office they had no mine, no ore, no tools, and only a shilling or two. They were a little better off now than when they started, and he thought they were not far from the end of their labours.—MR. JOHN YOUNG, of Messrs. Turquand, Youngs, and Co., was re-elected auditor, and the proceedings then terminated.

**GREAT SNAEFELL MINING COMPANY.**—The annual general meeting of shareholders was held in St. James's Hall, Douglas, on Wednesday, Nov. 27, Mr. H. B. Noble (chairman of directors) presiding. The accounts showed that the receipts had been 1462/- 19s. 7d. The labour cost of the year amounted to 822/- 14s., and merchants' bills to 515/- 13s. 11d. The balance brought down was 113/- 3s. 3d. The liabilities of the company amounted to 208/- 8s. 3d., and the assets to 274/- 5s. The secretary read the reports of the directors, manager, and auditor. The directors state that the dressing machinery has been set up, and is ready to commence working at any time, but

taking into consideration the low price of lead and blende ores it is not thought prudent at present to dress the ore-stuff at surface.

#### ST. JOHN DEL REY MINING COMPANY.

The half-yearly general meeting of shareholders will be held at the Cannon-street Hotel, on Wednesday, when the report of the directors, of which the subjoined is an extract, will be submitted.

During the half-year the general work at Morro Velho has been carried on steadily, and great efforts have been made to bring the machinery into the most efficient state. The gold obtained from April 9 to Oct. 8, both days inclusive, was 207,496 oits., or 23,921 ozs. Troy. The produce for the corresponding period of last year was 238,136 oits., or 27,458 ozs. Troy. An unusually long dry season has seriously impeded the stamping power. The rainfall for the year ending Sept. 30 was only 44.61 in., against 79.32 in. in the preceding 12 months. The net profit on the working of the mine for the half-year has been 38,169/- 6s. 4d.; in cash account during the half-year, 400/- 9s. 3d.; amount of net profit brought forward from last year, 5027/- 13s. total, 45,597/- 8s. 7d. From this deduc: London expenses for six months, 1194/- 18s. 6d., and there remains available for dividend 42,407/- 10s. 1d., out of which the directors have the satisfaction of recommending a dividend of 15 per cent. on the capital of the company for the half-year, free of income tax, which, with 10 per cent. thereon to the reserved fund, will absorb 41,745/-, and leave to be carried forward 657/- 10s. 1d.

The stamp shaft has been sunk vertically during the half-year 5 fms. 2 ft. 10 in., during the preceding half-year, 5 fms. 4 ft. 5 in., during the corresponding period of 1877, 3 fms. 4 ft. 10 in. The two eastern levels were extended during the first three months of the half-year—level over stamp 2 fms. 6 in., level under roof, 2 fms. 3 ft. 8 in., and the western level was extended during the same period 2 fms. 1 ft. 9 in. The development of the lode in the western section of the mine has been continued steadily during the half-year with satisfactory results. Although the mineral raised from the mine during the half-year has been stamped, and none rejected and thrown on the refuse heap, still it has been necessary for the proper working of the mine to quarry a considerable quantity of killas and other inferior mineral; 391 tons of this and other mineral were stamped at the Praia stamps, and yielded 4,659 oits., or 537 ozs. troy per ton. The remainder was stamped with the general mineral at the Morro Velho stamps, and tended proportionately to lower the yield of the mineral so stamped.

The quantity of gold recovered from 31,768 tons of minerals stamped at the Morro Velho stamps during the six months ending Sept. 30 was 189,442 oits., or 21,739/- 580 ozs. troy, giving an average standard or yield of 5,962 oits., or 6871 ozs. troy per ton. Of the above 31,768 tons stamped, 24,174 tons were of mixed mineral, stamped at the general stamps, and produced 5,581 oits., or 643 ozs. troy per ton, and 7594 tons were mineral freed from killas stamped separately, and produced 7,177 oits., or 828 ozs. troy per ton. Taking the difference occasioned by the mineral being now actually weighed and taken at its actual weight instead of, as formerly, by computation, it is shown that the standard of the general body of the mineral formation is as high, if not higher, than that at any former period.

The average loss of gold in treatment, ascertained by two different modes, and by assays made both at Morro Velho and in London, and the mean of the results, shows a loss of about 27/2 oitavas, or 3111 ozs. troy per ton, which, considering that the four sets of figures do not vary very considerably, may be taken as fairly approximating the actual loss. This loss is still large, though slightly less than the last year's report showed. Considerable improvements have been made in the stamping floors, and other arrangements are in course of being adopted, which the directors hope will lead to more satisfactory results during the current half-year.

Early in the year the directors gave instructions for a careful survey being made of all the water courses with a view to see whether by improvements in their construction, by carefully taking up all tributary streams, by stopping leaks, by improving the application of the power, by reducing the friction of the wheels, and by greater economy being exercised in the use of water for objects other than driving machinery, a sufficient increase of power might not be obtained from the existing water-courses without going to large expense in obtaining additional power from other sources. The matter was taken in hand by Mr. Oldham, the company's engineer, under the superintendent's direction, and the result has been most satisfactory. Mr. Oldham reports that the water supply can, at a very moderate expense, be so improved as to give sufficient power to drive all the necessary machinery at full speed, even in the dry season. The necessary works for accomplishing this desirable object were commenced in Aug., and will, it is hoped, be finished by the commencement of the next dry season.

The surface operations at the Cuiaba Mine have been confined to work necessary for accommodating the mechanics and labourers, for providing water power, and for erecting a stamping mill, to be ready for stamping the mineral when it can be brought to the surface in sufficient quantity. In the mine the levels opened by the former proprietor have been repaired and extended until the lode has been reached, and driven into in two opposite directions. At one point it has been crossed for a distance of 33 ft. without reaching the head-wall. These levels are being carried along the course of the lode in each direction. Cross cuts will now be made from them to ascertain the width of the lode, and a sufficient quantity of the lode from wall to wall extracted to fairly test its auriferous quality. The directors hope 1000 tons will be stamped before the annual meeting; they consider the average value of the lode for practical working purposes can only be ascertained by adopting this course.

The financial statement shows the securities in which the 54,600/- 11s. 7d. reserve fund is invested, and that after payment of dividend, &c., there is about 2600/- cash balance.

#### FOREIGN MINING AND METALLURGY.

The Belgian coal trade has not exhibited much change, although it may be observed that working operations have been a good deal interrupted by the fêtes of Saint Barbe and Saint Eloi. There is still a good current of deliveries, principally by railway, navigations being impeded by persistent floods. As the movement of sugar beet has been provided for the season, there have not been many complaints this year on the part of colliery proprietors as to an inadequate supply of rolling stock on the Belgian State Railways. Prices have been generally firmly maintained without variation; stocks are being reduced, and if the demand continues a slight advance in quotations appears possible, and even probable. In the Liège basin the condition of the collieries is also considered to have improved. Stocks have been reduced, and several collieries cannot provide for the demand which they have to meet; some descriptions of coal are accordingly advancing. The imports of coal into Belgium in the first ten months of this year were 567,215 tons, against 529,504 tons in the corresponding period of 1877; the imports of coke were 17,798 tons, against 18,709 tons. The exports from Belgium in the first ten months of this year were 3,097,385 tons, against 2,813,225 tons; the exports of coke were 470,619 tons, against 481,317 tons.

The Belgian iron trade remains quiet and stagnant. At the last meeting of the industrial bourse of Brussels the principal subject discussed was the approaching adjudication of trucks for the Belgian State Railways. The Thy-le-Chateau works are said to be carrying out some improvements in the manufacture of steel. The imports of minerals and lemailles into Belgium in the first ten months of this year are officially returned at 705,713 tons in the first ten months of 1878, as compared with 633,832 tons in the corresponding period of 1877. The imports of rough pig and old iron into Belgium in the first ten months of this year increased to 173,974 tons, as compared with 155,729 tons in the corresponding period of 1877. Of steel the imports into Belgium in the first ten months of this year were 4260/- 10s. 1d., as compared with 3889/- 10s. in the corresponding period of 1877. The exports of steel from Belgium increased in the first ten months of this year to 17,644 tons, against 9395 tons in the corresponding period of 1877. The exports of minerals and lemailles from Belgium to October 31 this year amounted to 208,958 tons, against 176,008 tons; of rough pig and old iron, to 3949 tons, against 9915 tons; of iron rails, to 28,120 tons, against 33,852 tons; of plates, to 19,952 tons, agars, 14,022 tons; and of other descriptions of iron, to 107,946 tons, against 88,264 tons.

A committee of colliery proprietors in the French departments of the Nord and the Pas-de-Calais, has been discussing the insufficiency of plant on the Northern of France Railway. In some pits, it appears, it has become necessary to suspend working operations in consequence of an inadequate supply of wagons. The Commission of Public Works in the Pas-de-Calais has appointed a delega-

tion to study ministerial projects prepared with reference to new canals and railways, as well as the question of a great canal from the North of France to Paris, upon which the Government appears to have virtually decided. On the other hand, M. Flament, ordinary engineer of the first class, has been specially charged by the Government with the duty of making surveys for the canal. M. Flament will reside for some time at Amiens for the purpose of conveniently devoting himself to his new duties.

In the French department of the Haute-Marne the works are now receiving orders, which maintain them for the most part in activity. Iron from coke-made pig has not yet fallen below 62.8s. per ton for first-class, but it is not selling at all freely. In the Nord the orders received on provincial account are a little more liberal than they were at the commencement of the month, but great difficulty is, nevertheless, experienced in effecting sales. In the Meurthe-et-Moselle pig remains without much change; the quotation at Nancy is 21.5s. per ton, and at Longwy 21.2s. 6d. per ton. The basin of the Loire and Rhone still presents some animation, but it is of no great importance. It is announced that MM. Durant Frères, of Louviers, near Manbengo, have just paid off 90 of their workpeople; the men will probably have considerable difficulty in finding employment under present circumstances. Depression prevails in Germany as well as in France. A meeting of the Darmstadt Foundries and Construction Workshops Company is about to be held to determine the important question whether the company's works shall be continued in operation. A forced realisation or liquidation of the concern would probably be attended with disastrous results.

A letter from Chemnitz says that an order for 18 locomotives, in addition to other commissions sufficient to keep the works going for several months to come, has been received in the Saxon Machine Factory (Hartmann's). Considerable orders have also been received in Zimmermann's Implement Factory in the same town.

#### THE WILD DUCK, OR SPORTSMAN'S ARMS.

"Well comrades," says Uncle Henny, "one more mitten will bring round Christmas again; and how fast time do fly away, don't it?" "Is, a do," says old Tom, "and some people will tell ee that time after a man is 20 year old run away twice so fast as a dog before 20." "I thought," says Jan Temby, "we should have something new this mitten: and 'tis something new sure enuff to know that time is longer before a man is 20 than a ter. Es that the only new thing, old Tom, thee's found out since last Christmas?" "Why no," says old Tom, "I've found out more than that a good deal." "Come then," says Jan, "out wed en for the good of the company." "Well, then, a cheap workman is the dearest; and the able and willing workman will never have fair play 'till he get a fair price in sight, and so much as a can do for the month. When this done adventurers and workmen will be gainers, for so much work will be done then in one month as is done now in two months. All the people in all the bals should be paid by 12 o'clock on Saturday, and all first core men and surface people should work till 12 o'clock on Saturday; six hours es long enuff for them to do their marketing and have a little pint, and right their accounts, and every man that wor not in his place working on Monday morning should be turned right out of the bal. I don't know there is much new in machinery." "What's the boring machine," says Jan. "The boring machine, Jan, was invented by Capt. Trevithick before you wor born, an if a es coming into use it es new thing. Capt. Trevithick's invention of the round boiler saved millions of money in Cornish bals, and if his boring machine was used from the time he invented it millions more would be saved, but his boilers benefited all the world, and I never heerd that so much as a moorstone posse wor put to stand upright to his memory. Monuments are so thick as blackberries for them that made fortins out of our bals and other things, but he that gave us millions, or his inventions ded, which 'tis all the same, is never mentioned with the big scientific and wise men of the institutions in the district where Trevithick wor born no more than if such a man never existed. I tell ee, men, the there institutions and classes and fine speeches look very fitty in the newspapers, but to my mind the should do some good fust—ivent some useful thing, and make the grand speeches afterwards." "I don't know," says Jemmy Dow, "what good the there institutions will do, but I do believe that good sometimes come out of evil. The boring machine is a good thing, but I don't think a would be used so soon, or 'prap's not at all, but for the low price of tin; the low price is making people open their eyes to find the way to make two ends mit. Who will say—I'm sure you can't, old Tom—but the there institutions you say have done no good will not yet produce another Columbus, or another Bolton and Watt, or another Sir Humphry Davy. There's so good fish in the sea as ever come out of it, and you don't know, old Tom, but bigger and brighter men than the great ones I've named are hatching in the eggs of the institutions, and so soon as the bust the shells and like young chicks able to crow, look out my boy, for then you will find inventions discovered to work our bals, and make profits with tin at 20/- a ton. Then, old Tom, you and everybody else will be saying, whatever would become of we and all the rest only for the institutions." "If you believe this, Jemmy," says old Tom, "we must allow that the drop in the price of tin will do more good than harm." "I believe it," says Jemmy, "and not the drop in tin only, but in all other minerals, for we working miners know very well that necessity will make men think more and work harder, improvements will be made in all directions, twice as much ground will be spent for the same money, engineers will make the engines do twice the present duty, dressers will save all the tin, and the copper and lead now left to run away, and other valuable things saved that the now throw over the dead burrows. All the there things will be done, old Tom, and scores of things besides; your dry dressing among the rest, and then everybody will be saying what a pack of fools we wor to be frightened with fearin' tin and copper. If every man will do his best we can and will beat the world, as we often ded before." "T'es all right enuff what you are saying, Jemmy," says Jan Jewill, "but what will become of all the bals while the things you are telling about, or before we get the benefit of all the there inventions and discoveries." "I'll tell ee, Jan, you know so well as I do that it es a sin to rise so much tin to pay dividends, and that the bals now struglin' to make profit ought to put that there money in boring machines, skips, and every other improvement, and while the things wor doing only rise barely enuff stuff to mit cost; but when all the new improvements are in coose, why them cut away like heroes, as dividends would be paid with a lot less cost, and the rising of a lot less stuff for you see after all that the stopping the dividends (to do the there things) for a short time would be exactly like lodgin' money in bank at 25 per cent. interest." "I think," says Uncle Henny, "that as tin will be sure to be rose at a less cost than now, a good many wise men and managing men might not be far wrong to take Jemmy Dow's advice—that is, save everything, make every improvement that can be made, and stick to un', and keep on improving, and we needn't care a pin for furrin' tin and copper; and I hope, comrades, we shall all be spared to meet again to have a comfortable Christmas, and a few good 'kerls."—From Cousin Jack's Unpublished MSS.

## HARRIS'S PATENT WROUGHT-IRON WINDOWS.

DOME AND OTHER ROOF LIGHTS, FLOOR AND PAVEMENT LIGHTS, ETC.

GREAT BRITAIN,  
UNITED STATES OF AMERICA,

PATENTED IN

FRANCE,  
GERMANY, AND BELGIUM.

ARE STRONGER, SUPERIOR, AND CHEAPER  
THAN ANY OTHER METAL SASHES YET  
PRODUCED—COST LESS FOR GLAZING—  
ARE AS CHEAP IN MANY CASES AS WOOD

—CAN BE DESIGNED AND MANUFACTURED  
TO SUIT ANY STYLE OF ARCHITECTURE  
OR POSITION WHERE A WINDOW MAY BE  
REQUIRED.

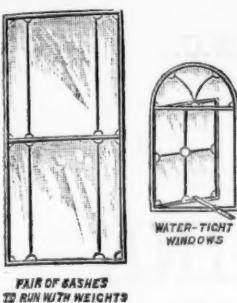
ARE BEING EXTENSIVELY USED IN—

Private Houses,  
Parsonage Houses,  
Farm Houses,  
Churches,  
Chapels,  
Schools,

Lunatic Asylums, &c.,  
Public Buildings, Banks,  
Wharves, Warehouses,  
Factories, Mills,  
Breweries, &c.,  
Engine Houses.



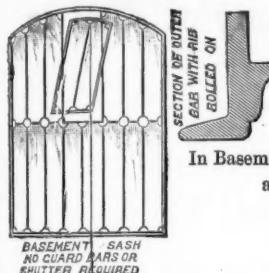
FRONT OF BOSS 1/2 FULL SIZE



FRONT OF BOSS 1/2 FULL SIZE

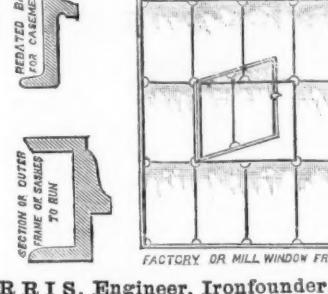
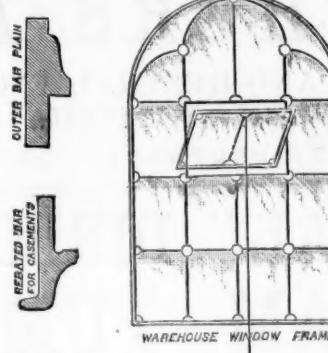
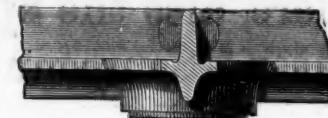


FRONT OF BOSS 1/2 FULL SIZE



FRONT OF BOSS 1/2 FULL SIZE

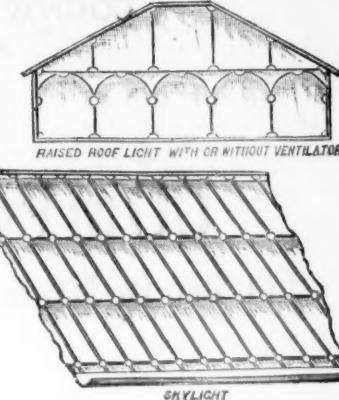
ILLUSTRATED CATALOGUES  
ON APPLICATION.



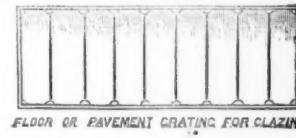
ILLUSTRATED CATALOGUES  
ON APPLICATION.



BACK OF BOSS 1/2 FULL SIZE



RAISED ROOF LIGHT WITH OR WITHOUT VENTILATOR



SKYLIGHT

FLOOR OR PAVEMENT GRATING FOR GLAZING

Security is obtained in  
these Skylights without  
Guard Bars, and with less  
obstruction to Light.

EXPORT.

## SOLID DRAWN BRASS BOILER TUBES

FOR LOCOMOTIVE AND MARINE BOILERS

EITHER

MUNTZ'S OR GREEN'S PROCESS

MUNTZ'S METAL COMPANY (LIMITED),

FRENCH WALLS,

NEAR BIRMINGHAM.

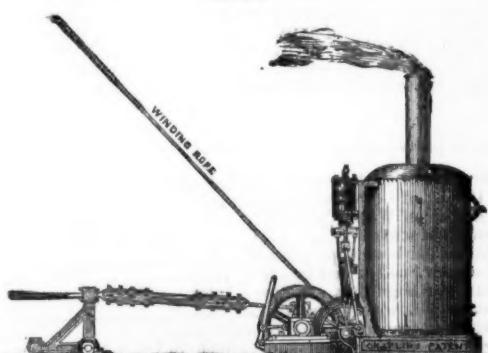
THE TAVISTOCK IRONWORKS, ENGINWORKS  
FOUNDRY, AND HAMMER MILLS,  
TAVISTOCK, DEVON.

NICHOLLS, MATTHEWS, AND CO.  
ENGINEERS, BRASS AND IRON FOUNDERS,  
BOILER MAKERS AND SMITHS.  
MAKERS OF

CORNISH PUMPING, WINDING, AND STAMPING ENGINES; STEAM  
CAPSTANS AND CRUSHERS; WATER-WHEELS; PUMP-WORK;  
SHOVELS, AND HAMMERED IRON FORGINGS OF EVERY  
DESCRIPTION.

Also of SPUR, MORTICE, MITRE, BEVIL, and other WHEELS, of any dia-  
meter up to 12 feet, made by Scott's Patent Moulding Machine, without the  
aid of patterns, and with an accuracy unattainable by any other means.  
MACHINERY OR FOREIGN MINES carefully prepared.  
SECONDHAND MINING MACHINERY, in good condition, always on sale.  
at moderate prices.

Prize Medal—International Exhibition, 1862.



## CHAPLIN'S PATENT PORTABLE STEAM ENGINES

FOR PUMPING AND WINDING.  
SPECIAL ADAPTED FOR PITS, QUARRIES, &c.  
SIMPLE AND STRONG; require NO FOUNDA-  
TION OR CHIMNEY STALK, and are  
EASILY ERECTED OR REMOVED.

Sizes, from 2 to 30-horse power.

Steam Cranes, 1/2 to 30 tons, for railways, wharves,  
&c.; hoist, lower, and turn round in either direction  
by steam.

Stationary Engines, 2 to 30-horse power, with  
without gearing.Hoisting Engines, 2 to 30-horse power, with  
or without jib.

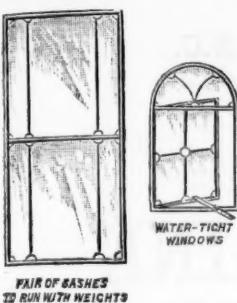
Contractors' Locomotives, 8 to 27-horse power.

Traction Engines, 6 to 27-horse power.

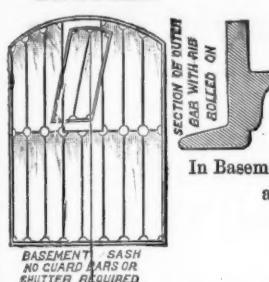
Ships' Engines, for winding, cooking, and distilling  
passed by H. M. Government for half power.Steam Winches. Engines and Boilers for  
light screw and paddle steamers.WIMSHURST, HOLLIK, & CO.,  
ENGINEERS.

CITY OFFICES: 2, WALBROOK, LONDON, E.C.  
WORKS: REGENT'S CANAL DOCK, 62, COMMERCIAL ROAD EAST,  
LONDON, E. [near Stepney Station.]

THE NEWCASTLE DAILY CHRONICLE  
(ESTABLISHED 1764.)  
THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER  
Offices, Westgate-road, Newcastle-upon-Tyne; 50, Howard street, North  
Bridge; 155 High street, Sunderland.

PAIR OF SASHES  
TO RUN WITH WEIGHTS

ILLUSTRATED CATALOGUES  
ON APPLICATION.

PAIR OF SASHES  
TO RUN WITH WEIGHTS

IMPROVED SUPPORTS FOR DRIVING, SINKING, ETC.

CONTRACTS TAKEN. MACHINES LET ON HIRE.

## SCHRAM AND OLIVER'S PATENT COAL CUTTER.

RICHARD SCHRAM AND CO.,  
CONSULTING ENGINEERS,  
9, NORTHUMBERLAND STREET, CHARING CROSS,  
LONDON, W.C.

Messrs. OLIVER and CO., Limited,  
SOLE MANUFACTURERS,  
BROAD OAKS IRON WORKS,  
CHESTERFIELD.

Also the best WINDING and HAULING ENGINES, BOILERS, PUMPS, &c., &c. GUIBAL VENTILATING FANS, AIR RECEIVERS, WAGONS, PIT-HEAD STOCKS, SCHRAM'S STONE-CUTTING MACHINE, and every description of COLLIERY and MINING PLANT and CASTINGS. Illustrated Catalogues and Price Lists, and references to places where the machinery may be seen in operation, on application.

TO LAND OWNERS, MINE OWNERS, HIGHWAY BOARDS, CONTRACTORS, MANURE  
MANUFACTURERS, FARMERS, AND OTHERS.

## THE DUNSTON ENGINE WORKS COMPANY, GATESHEAD-ON-TYNE

ARE THE SOLE MANUFACTURERS OF

## Archer's New Patent Stone Breaker,

As supplied to the Right Hon. the Earl of Derby, Sir W. G. Armstrong, C.B., &c., &c., which is most efficient in operation,  
and makes the best Road Metal.

### ARCHER'S NEW PATENT ORE CRUSHER,

Combines strength and efficiency with moderate cost, and supersedes all other modes of crushing ores.

### Archer's New Patent Bone Crusher,

Which is by far the best machine yet brought out, and crushes greasy or dry bones with equal ease. It has dealt in a most suc-  
cessful way with solidified guano.

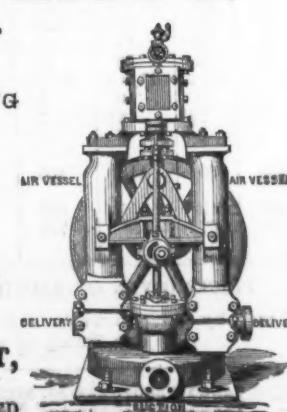
Long experience has enabled the Dunston Engine Works Company to bring their machines to great perfection.

Price lists and particulars, with illustrations, sent on application to Mr. THOMAS ARCHER, Jun., Manager, at the works; or to  
the London Office, 122, Dunster House, Mark-lane, London.

## CLARKE AND SUTCLIFFE.

CLARKE'S SILENT FANS,  
BLAST AND EXHAUST.  
MINE VENTILATORS.  
HAND-POWER FANS FOR SINKING  
AND DRIFTING.  
PORTABLE FORGES.  
SHIP VENTILATORS.  
SLATE MACHINERY.  
SMITHS' HEARTHS.  
TURBINE WATER-WHEELS.  
DOUBLE-ACTING STEAM PUMP.

UNION IRONWORKS,  
Rochdale Road, Manchester,  
LATE  
THE UNION ENGINEERING COMPANY, LIMITED

THE EXCELSIOR EXHAUST  
FAN



## PARIS EXHIBITION, 1878.

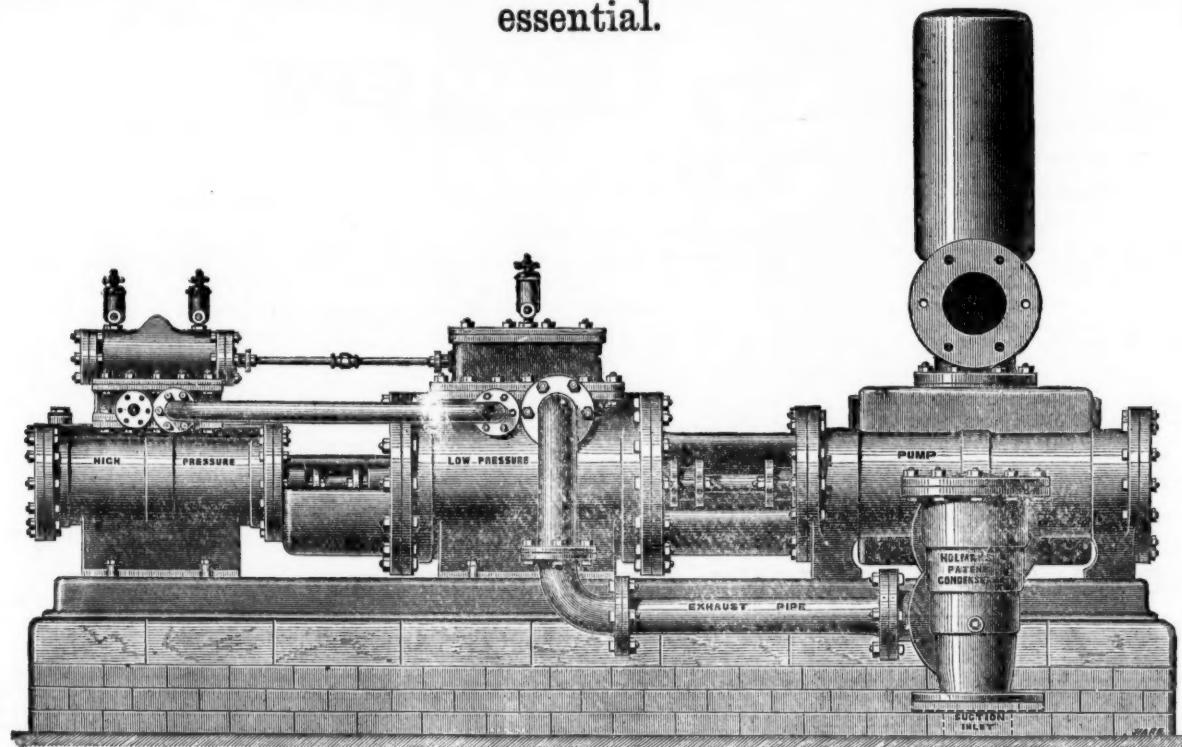
**GOLD AND SILVER MEDALS AWARDED** for Steam-Engines & Boilers, also the Special Steam Pump, with Holman's Condenser & Compound Pumping Engine.

# TANGYE BROTHERS AND HOLMAN,

HYDRAULIC AND GENERAL ENGINEERS,  
CORNWALL HOUSE, 35 QUEEN VICTORIA STREET, LONDON, E.C.,  
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

## THE "SPECIAL" DIRECT-ACTING COMPOUND STEAM PUMPING ENGINE

For use in Mines, Water Works, Sewage Works, and all purposes where Economy of Fuel is essential.



After several years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once

### THE SIMPLEST AND MOST CERTAIN IN ACTION.

The illustration shows an extension of the principle of this Pump to a Compound Steam Pumping Engine, by which the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere. The Engine combines simplicity, certainty of action, great compactness, fewness of parts, and consequent reduction in wear and tear.

Several thousands of the "Special" Steam Pumping Engines, with high-pressure cylinders only, are in use in British and Foreign Mines, Water Works, &c.,—and for confined situations, or where Engines of comparatively small size only are necessary, they will still meet all requirements—but their application will be very largely increased, since it has been found practicable to embrace the important features of expanding and condensing the steam, so that increased power may be obtained, and the consumption of fuel greatly economised.

THE "SPECIAL" DIRECT-ACTING COMPOUND STEAM PUMPING ENGINE is the most simple appliance for deep mine draining and general purposes of pumping ever practically developed, and the first cost is very moderate compared with the method of raising water from great depths by a series of 40 to 50 fathom lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pit-work are required, while they allow a clear shaft for hauling purposes.

### SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder.....	In.	8	8	8	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder .....	In.	14	14	14	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder .....	In.	4	5	6	5	6	7	8	6	7	8	7	8	10	12
Length of stroke .....	In.	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate .....		3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450
Diameter Suction and Delivery .....	In.	3	3½	4	3½	4	5	6	4	5	6	8	5	6	8
Diameter High-pressure Steam Inlet.....	In.	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	2½	2½
Diameter Low-pressure Steam Exhaust.....	In.	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	2½	2½
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder .....		360	330	160	360	250	184	140	360	264	202	130	360	275	175
Ditto ditto ditto—with Holman's Condenser...		480	307	213	480	333	245	187	480	352	269	173	480	367	234
Ditto ditto ditto—with Air-pump Condenser...		600	384	267	600	417	306	335	600	440	337	216	600	459	203

### CONTINUED.

Diameter of High-pressure Cylinder .....	In.	16	16	16	16	18	18	18	21	21	21	24	24	24	30
Ditto of Low-pressure Cylinder .....	In.	28	28	28	28	32	32	32	36	36	36	42	42	42	52
Ditto of Water Cylinder .....	In.	8	10	12	14	8	10	12	14	10	12	14	12	14	14
Length of stroke .....	In.	36	36	36	36	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate .....		15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,950
Diameter Suction and Delivery .....	In.	6	8	9	10	6	8	9	10	8	9	10	8	9	10
Diameter High-pressure Steam Inlet.....	In.	2½	2½	2½	2½	3	3	3	3	3½	3½	3½	4	4	5½
Diameter Low-pressure Steam Exhaust.....	In.	3	2	3	3	3½	3½	3½	4	4	4	5	5	5	6½
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder .....		360	230	160	118	456	292	202	149	397	276	202	518	360	562
Ditto ditto ditto—with Holman's Condenser...		480	307	213	154	603	389	269	198	528	363	269	691	480	750
Ditto ditto ditto—with Air-pump Condenser...		600	384	267	191	750	486	337	248	660	450	337	864	600	937

### PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

# HUDSWELL, CLARK & RODGERS,

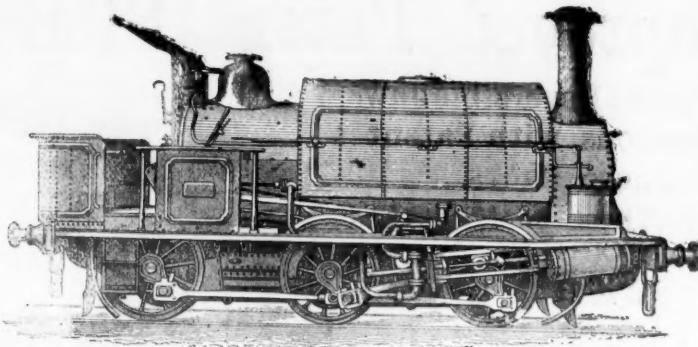
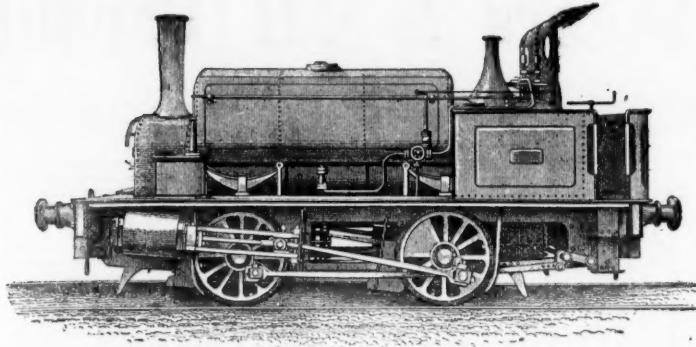
## RAILWAY FOUNDRY, HUNSLET, LEEDS,

### TANK LOCOMOTIVE,

ARE NOW MAKING A GREATLY IMPROVED  
CLASS OF

EITHER ON FOUR WHEELS OR SIX, OF  
VARIOUS GAUGES,

IN WHICH EXTRA STRENGTH AND DURABILITY ARE COMBINED WITH SIMPLICITY AND ECONOMY IN REPAIRS.



FIRE BOXES—Copper. TUBES—Brass. TYRES—Steel. AXLES—Steel. BOILER PLATES AND MACHINERY or the best Yorkshire Iron. NEW LOCOMOTIVES, with Cylinders 8 in., 10 in., and 13 in. diameter, always in stock or in progress. SECOND-HAND LOCOMOTIVES, of various sizes FOR SALE OR HIRE.

PRICES AND SPECIFICATIONS ON APPLICATION.

Awarded Gold Medal, Paris Exhibition, 1878,

AND THE PRIZE MEDALS AT LEEDS, MANCHESTER, AND WREXHAM EXHIBITIONS, 1875 AND 1876.

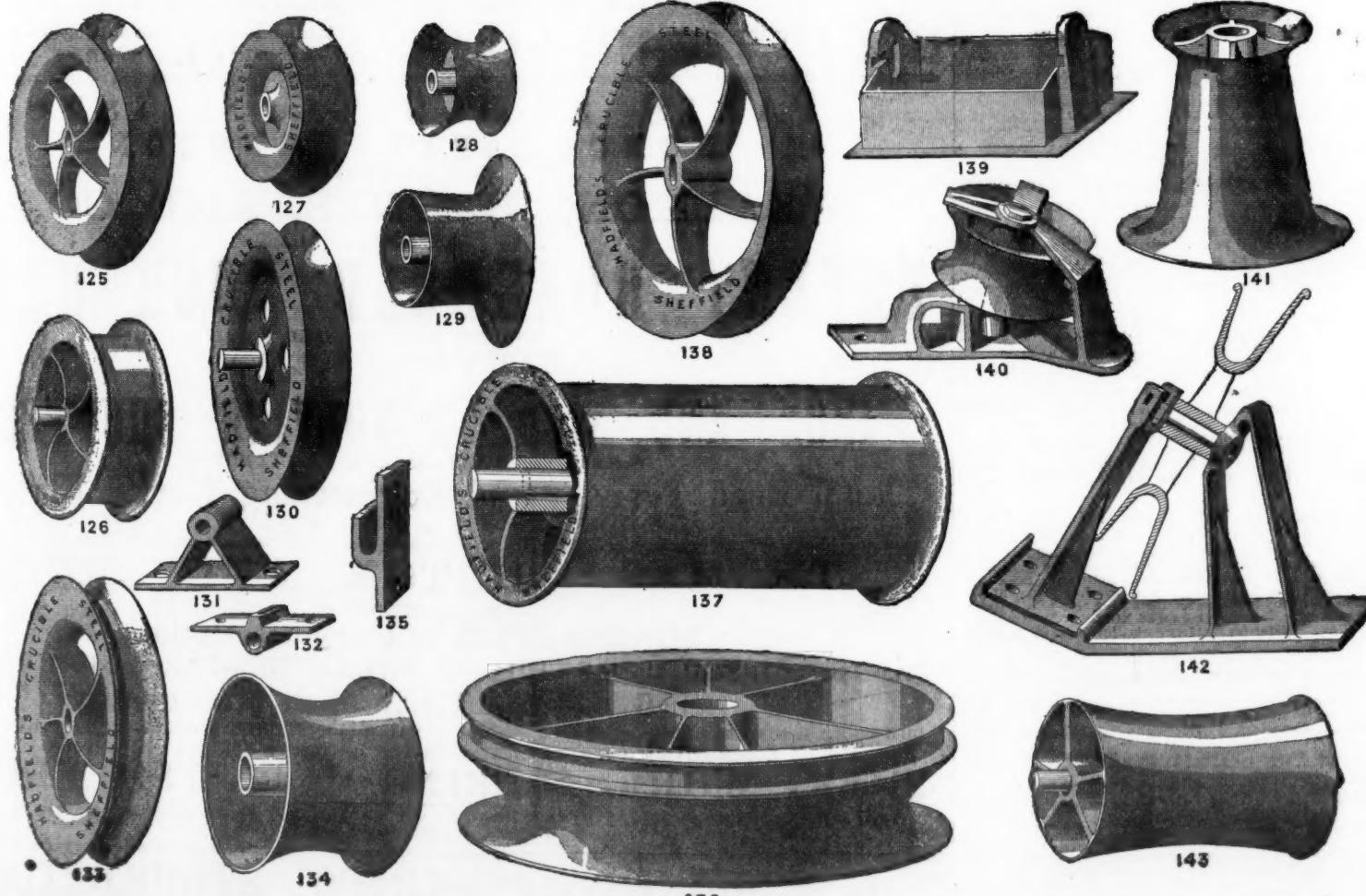
## HADFIELD'S STEEL FOUNDRY COMPANY, ATTERCLIFFE, SHEFFIELD,

DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

CRUCIBLE STEEL CASTINGS, for Engineering and Mining Purposes,

AND ARE THE SOLE MAKERS OF

## Hadfield's Steel Rollers and Pulleys.



*This Advertisement is varied from time to time.*

The following are some of the advantages claimed by the above Rollers and Pulleys:—  
1.—LIGHTNESS.—They are cast by us from one-third to one-half lighter than cast-iron.

2.—SAVING OF HAULAGE POWER AND WIRE ROPES.—Our Pulleys and Rollers, being extremely light, they effect a great saving in haulage power, and considerably prolong the life of wire ropes. As our Rollers and Pulleys are equally balanced, and never lop-sided, the instant the rope or chain touches they readily revolve, and all grinding or sawing by the rope is avoided.

3.—STRENGTH.—Although extremely light they cannot be broken by ordinary means—say by the sudden passing of chains over them such as frequently connect the rope to the wagon, or hang loose from the end of the passing wagons.

4.—DURABILITY.—One of our Crucible Steel Rollers or Pulleys will outlast about TWELVE IRON ONES.

5.—They reduce wear and tear to a minimum, and are a great saving in working expenses.

*This Sheet of Drawings is Copyright.*

FOR LIST OF PATTERNS, SIZES, AND WEIGHTS SEE LISTS NO. 7 FOR ROLLERS AND NO. 7A FOR PULLEYS.

At the PARIS EXHIBITION the Jurors have Awarded

THE GOLD MEDAL, THE SILVER MEDAL, AND HONOURABLE MENTION  
FOR MY LATEST PATENTED STONE BREAKERS AND ORE CRUSHERS.

Stones broken equal, and Ores better, than by hand, at one-tenth the cost.

H. R. MARSDEN,

ORIGINAL PATENTEE AND SOLE MAKER OF BLAKE'S

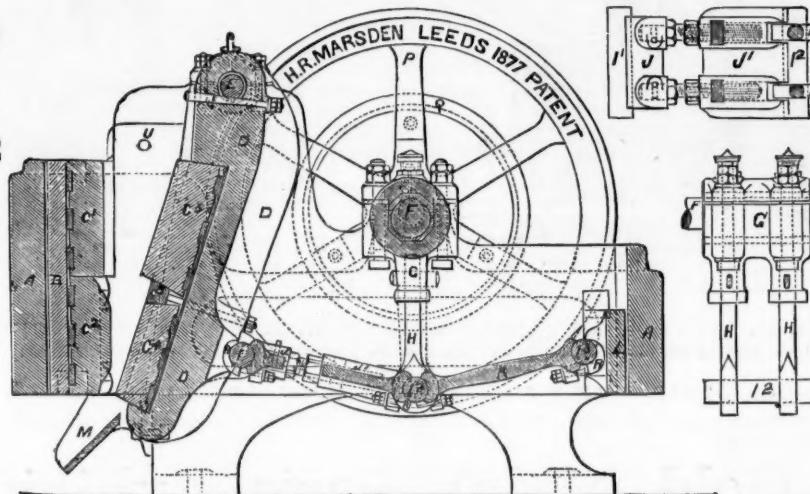
## Improved Patent Stone Breakers &amp; Ore Crushers.

New Patent Reversible Jaws,  
in Sections, with Patent  
Faced Backs.NEW PATENT ADJUSTABLE  
TOGGLES.  
OVER 2500 IN USE.New Patent Draw-back  
Motion.

NEW PATENT STEEL TOGGLE BEARINGS.

70

PRIZE MEDALS.



GREATLY REDUCED PRICES ON APPLICATION.

ALL BEARINGS are renewable, and made of H.R.M.'s Patent Compound ANTIFRICTION METAL.

CATALOGUES, TESTIMONIALS, &amp;c.

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

The Barrow Rock Drill  
COMPANY

Are now prepared to supply their DRILLS, the ONLY ONES that have been SUCCESSFULLY WORKED in the MINES of CORNWALL. At DOLCOATH MINE, in the HARDEST known ROCK, a SINGLE MACHINE has, since its introduction in July, 1876, driven MORE THAN THREE TIMES the SPEED of HAND LABOUR, and at TWENTY PER CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together, and at a proportionately increased speed. They are strong, light, and simple, easily worked, and adapted for ends and stopes, and the sinking of winzes and shafts.

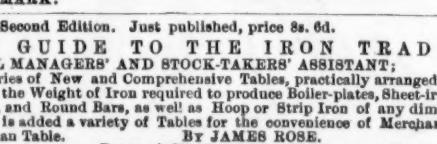
The company are also prepared to SUPPLY COMPRESSORS, and all necessary appliances for working the said Drills.

Apply to—

LOAM AND SON,  
LISKEARD, CORNWALL.

BICKFORD'S PATENT  
SAFETY FUSE  
FOR CONVEYING  
FIRE TO THE  
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Wharhole Lime Works, Maryport, Whitehaven,  
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H. E. MARSDEN, Esq., Soho Foundry, Meadow-lane, Leeds.  
DEAR SIR.—The machine I have in use is one of the large  
size, 24 in. by 12 in. The quantity we are breaking daily with  
this one machine is 250 tons, the jaw being set to break to a  
size of 2½ in. We have, however, frequently broken over  
300 tons per day of ten hours, and on several occasions over  
360 tons during the same period. The stone we break is the  
blue mountain limestone, and is used as a flux in the various  
ironworks in this district. We have now had this machine in  
daily use for over two years without repairs of any kind, and  
have never had occasion to complain of any inconvenience in  
using the machine. I hope the one you are now making for  
me may do its work equally well. The cost—INCLUDING EN-  
GINE-POWER, COALS, ENGINEER, FEEDING, and all EXPENSES  
OF EVERY KIND—is just 3d. per ton. Should any of your  
friends feel desirous of seeing one of your machines at work  
I shall have much pleasure in showing the one alluded to.

I am, dear Sir, yours very truly,  
WILLIAM MILLER.

## AND THIS—

Wharhole Lime Works, Aspatria, Cumberland,  
July 11th, 1873.

H. R. MARSDEN, Esq., Soho Foundry, Leeds.  
DEAR SIR.—We are in receipt of your letter of 4th inst.,  
may just state that the stone breaker above named has been  
under my personal superintendence since its erection, and  
have no hesitation in saying that it is as good now as it was  
five years ago.

I am, dear Sir, yours faithfully,  
FRANCIS GOULD.

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